



# HOW TO INSTALL THREE-LAYER FRENCH HERRINGBONE/CHEVRON HARDWOOD FLOORBOARDS WITH TONGUE AND GROOVE LOCKING SYSTEM – Glue-Down Flooring Installation Instructions

## 1. GENERAL GUIDANCE – BEFORE STARTING

### Floor storage

The packs containing floorboards must be handled carefully during transport and unloading to avoid any mechanical damage. Floorboards in the original packaging should be kept in a dry place, in a horizontal position, on pallets or wooden beams to provide free space of at least 75 mm (3") between the boxes and the subfloor. Before the floor is delivered to a building provided with doors and windows, all "wet" works must be completed, e.g. plastering, construction of partition walls, screed application, skimming, painting, etc. These works must be finished and any wet materials must be at the same humidity level as during the normal use of the area. If there are any cellars below the floor installation area in the building, they must be dry and well ventilated. Multi-layer hardwood flooring should be kept in the original packaging in the room where it is to be laid for at least 48 hours to ensure floor is acclimated. Additional air-conditioning systems installed in the house or apartment should be activated at least 14 days before, during and after the installation of the floor. The relative humidity in the area where the hardwood flooring is stored and installed should be kept between 45% and 60%. The air temperature should be between +64.4°F and +75.2°F (+18°C to +24°C). The moisture content of the wooden substrate (wood-based panels) should not exceed 9%. The moisture content of the concrete substrate should not exceed 2% and that of the anhydrite substrate – 0.5%. The moisture content of the substrate should be measured using the carbide method. The measurement results should be recorded.

### Responsibility

Before fitting the multi-layer hardwood floor, the developer/fitter must ensure that the installation site meets all the applicable standards. Always comply with the recommendations of the building industry and local regulations. The manufacturer accepts no liability for improper working conditions on the installation site. Before installation the developer/fitter should inspect the multi-layer hardwood floorboards and confirm that they comply with the purchase order. The floorboards should be inspected for the grade, quality, finish, gloss, color, mechanical damage and class of the top layer (all the information is provided on the label and/or in the purchase order). The developer/fitter is fully responsible for the final quality control of the multi-layer floorboards. Before installation, all the multi-layer hardwood floorboards should be checked. If in doubt, the developer/fitter should not use any of the boards considered to be unsuitable for installation and he should contact the seller immediately.

When ordering the floor, a waste factor about 10% should be taken into account. If the boards are to be laid diagonally or connected along a curved line with other floor types, a waste factor about 15% should be taken into account. The manufacturer accepts no responsibility if the floor is laid outdoors, in bathrooms, in areas exposed to relative humidity levels other than from 45% to 60%, in areas exposed to direct contact with water or other liquids, in areas where the temperature is other than from +64.4°F to +75.2°F (+18°C to +24°C).

The final inspection by the end user should be carried out while in the standing position.

### Important for fitters

Sawing, sanding and processing of hardwood products and wood-based materials can produce wood dust. Airborne wood dust can cause irritation of the respiratory system, eyes and skin. The International Agency for Research on Cancer (IARC) has classified wood dust as a human carcinogen.

### Precautions

If electric saws are used for cutting boards or wood-based materials, they must be provided with dust extractors. The fitter should always use an appropriate NIOSH-certified dust mask and safety goggles during cutting operations. Always protect your eyes and skin against contact with wood dust. In case of irritation from wood dust, rinse the eyes or skin with clean water for at least 15 minutes.

If you have any questions about the installation and maintenance of the floor or you would like to receive a Safety Data Sheet, please contact the distributor or retailer where you purchased the material, or visit our website.

### IMPORTANT HEALTH INFORMATION ALL OF OUR NORTH AMERICAN PRODUCTS MEETS CURRENT TSCA TITLE VI STANDARDS AND ARE CARB 2 COMPLIANT AND FLOORSORE CERTIFIED

THESE CONSTRUCTION MATERIALS CAUSE FORMALDEHYDE EMISSIONS. EXPOSURE TO FORMALDEHYDE HAS BEEN REPORTED TO CAUSE IRRITATION OF THE EYES, NOSE AND THROAT, HEADACHE, SICKNESS AND A VARIETY OF ASTHMA-LIKE SYMPTOMS, INCLUDING SHORTNESS OF BREATH. THE ELDERLY, OLDER AND YOUNGER CHILDREN, AND ANYONE WITH A HISTORY OF ASTHMA, ALLERGIES OR LUNG PROBLEMS MAY BE AT HIGHER RISK. RESEARCH INTO THE POSSIBLE EFFECTS OF LONG-TERM EXPOSURE TO FORMALDEHYDE ARE ONGOING.

INSUFFICIENT VENTILATION MAY CAUSE THE ACCUMULATION OF FORMALDEHYDE AND OTHER AIRBORNE CONTAMINANTS INDOORS. FORMALDEHYDE LEVEL IN THE AIR TENDS TO INCREASE WITH HIGH TEMPERATURES INDOORS AND HIGH HUMIDITY. IF YOUR HOUSE IS EXPOSED TO EXTREME TEMPERATURES IN THE SUMMER, YOU MAY USE AN AIR-CONDITIONING SYSTEM TO CONTROL THE TEMPERATURE INDOORS. OTHER UNITS AND SYSTEMS DESIGNED FOR CONTROLLED MECHANICAL VENTILATION MAY ALSO BE USED TO REDUCE THE LEVEL OF FORMALDEHYDE AND OTHER AIRBORNE CONTAMINANTS INDOORS.

IF YOU HAVE ANY QUESTIONS ABOUT THE HEALTH EFFECTS OF FORMALDEHYDE, PLEASE CONSULT YOUR DOCTOR OR A LOCAL HEALTH CARE CENTRE.

### WARNING

IF THERE ARE ELASTIC FLOOR COVERINGS AND ASPHALT-BASED ADHESIVES IN THE HARDWOOD FLOOR INSTALLATION AREA, AVOID GRINDING, DRY SWEEPING, DRY SCRAPING, DRILLING, SAWING, SHOT-BLASTING AND USING MECHANICAL METHODS FOR REMOVING THE EXISTING FLOOR COVERINGS, FLOOR SUBSTRATES, ASPHALT-BASED ADHESIVES OR ANY OTHER ADHESIVES!

The existing materials may contain asbestos fibers and/or crystalline silica. Avoid the formation of dust. Inhalation of dust creates the risk of cancer and respiratory problems. If a product is not known to be free of asbestos, it should be presumed to contain asbestos. Smoking by people exposed to contact with asbestos fibers significantly increases the risk of serious injuries. Under regulations of law it may be required to test materials for the asbestos content as well as to follow specific procedures for their removal and disposal. For guidance on the removal of resilient floor coverings, see the current edition of the guidebook published by the Resilient Floor Covering Institute (RFCI): Recommended Work Practices for Removal of Resilient Floor Coverings' or contact your distributor or retailer where you purchased the material.

Hardwood floorboards delivered in this pack DO NOT CONTAIN ASBESTOS.

## 2. STANDARDS REQUIREMENTS FOR SUBSTRATE

The purpose of the recommendations for the quality of the substrate is to ensure the correct installation of multi-layer floorboards. They are in no way intended to replace any federal, state or local building regulations.

Multi-layer floor can be laid on substrates which meet the following standard requirements:

**Flat** – the maximum unevenness of the substrate should not exceed 1/8" (3 mm) over 6.56 ft (2 m) when measured with level. Any recesses or uneven areas should be filled with special materials designed for this purpose. The maximum horizontal offset over the entire floor area must not exceed 3/16" (5 mm).

**Dry** – concrete substrates should be cured for at least 60 days. The moisture content of the concrete substrate should be tested using the calcium carbide test (carbide method) and the result must not exceed 2% for concrete substrates and 0.5% for anhydrite substrates. The moisture content of the wooden substrate (wood-based panels) should not exceed 9%.

The measurement results should be recorded.

**Clean** – free of dirt, cement, putty, plaster, paint, oil, glue, plaster or other residues. Floors are not suitable for installation on substrates cleaned by chemical methods.

### WOODEN SUBSTRATE – REQUIREMENTS

Multi-layer boards can be fixed to the wooden substrate such as solid wood boards, OSBs or other boards specified below. This substrate should be permanently fixed to the subfloor (e.g. wooden beams) using staples or nails. Any "squeaky" areas should be fixed by nailing or screwing them down. The spacing between the fasteners fixing the wooden substrate to the beams should be about 6" (15 cm). Any delaminated, swollen and damp panels should be replaced with new ones. The spacing between the beams under wood-based panels should be in accordance with the relevant building regulations. The moisture content of the wooden substrate should not exceed 9% when measured with needle meter. As a manufacturer of multi-layer hardwood floors, we are not able to assess every underlay on which the floor is to be installed. The responsibility for choosing the spacing and distances, and assessing the substrate lies with the devel-

oper, engineer, architect or consumer, who are in a better position to evaluate the expected result based on test results for the floor installation area.

**Hardwood plywood** should be at least CDX class (display 1) and meet the US Voluntary Product Standard PS1 or Canadian CAN/CSA 0325-0-92 performance standards. The optimum thickness is 3/4" (19 mm) for the substrate [at least 5/8" (16 mm)] and 3/8" (9.5 mm) for the floor underlay.

**OSBs** should meet the US Voluntary Product Standard PS2 or Canadian CAN/CSA 0325-0-92 performance standard for structural coatings. Check the panel code on the underside. When used as the floor underlay, the panels should be tongue-and-groove boards laid with the impregnated side facing down. The minimum thickness is 23/32" (18 mm) for the substrate and 3/8" (9.5 mm) for the underlay.

**Waferboards and chipboards** should meet the US Voluntary Product Standard PS2 or Canadian CAN/CSA 0325-0-92 performance standards. The minimum thickness is 3/4" (19 mm) for the substrate and 3/8" (9.5 mm) for the underlay.

**Chipboards** should have a density of at least 40 pounds/cubic feet. (641 kg/m<sup>3</sup>), approved underlay class, and 3/4" (19 mm) thickness (floating floors only).

**Solid wood underlay** should be fitted using glue-down or staple-down installation.

Thickness min. 3/4" (19 mm) and width max. 6" (15 cm) at 45° with respect to the beams.

Coniferous wood from density group 1 (pine, larch, green Douglas, etc.) No. 2 common dried wood, all board ends on beams.

A 3/8" (9.5 mm) floor panel of the approved type can be added for the glue-down installation procedure.

### CONCRETE SUBSTRATE – REQUIREMENTS

The glue-down procedure is not recommended for installation of multi-layer floor on lightweight concrete substrate. To check if the substrate is made of lightweight concrete, scratch the substrate surface with steel stylus (Fig. 1). If the surface is easy to scratch and the edges of the line crumble, the concrete does not have sufficient strength for gluing multi-layer boards. If this case, the floor cannot be glued.

The glue-down procedure should only be used with concrete grades 3,000 psi or higher. Glue-down installation on lightweight concrete (less than 3,000 psi) is not permitted.

Always perform the glue bonding test before starting glue-down installation.

The moisture content of the substrate should not exceed 2% when measured using the carbide method. The measurement should be performed out in areas which are most exposed to increased humidity – under stairs, in corners or areas with no direct exposure to sunlight.

### Installation over water underfloor heating

When fitting multi-layer floorboards over water underfloor heating, the screed heat-up procedure should be performed. The procedure involves heating up the floorboards at regular intervals to eliminate any residual moisture from the screed and to avoid the risk of hazardous stress in the underlay. For the screed heat-up procedure, see [www.hardwood-installation.eu](http://www.hardwood-installation.eu). Following the underlay heat-up process, you can start laying the floor.

### Glue-down installation over water underfloor heating

When fitting a glued floor, make sure that the glue retains its properties and flexibility even when exposed to significant temperature differences. Glue is not manufactured by the producer, and therefore you should use products designed for floor installation. There are special pictograms and information on the packaging to indicate if the specific glue can be used for floor installation over underfloor heating. The producer recommends hiring a professional floor company for glue-down floor installation.

### Attention!

When checking the underlay using a 6.56 ft (2 m) level, the offset of the underlay from the horizontal must not exceed 1/8" (3 mm) over 6.56 ft (2 m) at any point on the surface.

### Guidelines for fitters and users of hardwood floors over electric or water underfloor heating

- To ensure the optimum floor covering for installation over underfloor heating, use readymade three-layer hardwood boards connected by a glue-free click locking system.
- If you opt for a glued floor, make sure that the glue you have chosen to use will retain its properties and flexibility throughout many years, even when exposed to significant temperature differences.
- Installation of floorboards over underfloor heating can only be started after the heating subfloor heat-up report has been prepared and signed by a properly qualified installation team. If the heating system is turned off during the screed heat-up process, the heating system should be set to 70°F (21°C) for several days before starting the installation and the floor should laid at this temperature. The screed heat-up process should also be performed in the summer. The screed heat-up procedure should only be used when laying floor over water underfloor heating.
- To ensure the correct installation of the floor, make sure that the humidity level does not exceed the acceptable levels when the floor is being laid or later when it is used. The appropriate humidity level for boards is 7% ± 2%.
- To achieve the optimum temperature, it should be kept at 21°C (70°F) during the first 48 hours after installation, and then increased by 1-2 degrees per day. The heating level should not exceed 84°F (29°C) at the surface of the floorboards. The relative humidity in the area must be maintained at 45-60% throughout the year, whether the heating system is on or off.
- The moisture content of the screed must not exceed: 1.8% for cement screed when measured using the carbide method (CM), 0.5% for anhydrite screed when measured using the carbide method (CM).
- To prevent uneven expansion/contraction of wood, the entire floor area should be provided with heating. This will also help to ensure the best possible comfort of use (without any 'cold spots' over the floor surface).
- Hardwood floor installed over underfloor heating must not be covered with carpets. All furniture placed over underfloor heating, such as sofas, should have legs at least 4" (10 cm) high.
- Small gaps may be observed between the boards during the heating season due to the minimum expansion/contraction of wood.
- At the end of the heating season, the temperature should be gradually reduced by about 33.8°F (1°C) or 35.6°F (2°C) per day. **CAUTION: The temperature at the floor surface must never exceed 84°F (29°C).**

## 3. GLUE-DOWN INSTALLATION

### Recommended tools and materials for floor installation:

- Safety goggles
- NIOSH-certified dust mask
- Wood/concrete moisture meter
- Appropriate glue for fitting multi-layer boards
- Primer system for glue – if required by the glue manufacturer
- Roller for primer application
- Putty knife for removing residues from the substrate
- Appropriate steel trowel recommended by the glue manufacturer
- Steel hammer 1.5lbs to 2.5lbs (800 g to 1000 g)
- Vacuum cleaner or sweeping brush
- Expansion wedges
- Tapping block
- Tape measure
- Pencil
- Mitre saw or table saw
- Trimmer
- Trowel for glue application
- Glue remover
- Cleaning cloths
- Knee pads
- Protective gloves
- Floor shunting tool
- Carpenter's square

### General requirements:

Before starting the floor installation, the central heating and air-conditioning systems should remain switched on for 14 days.

The boards in the original packaging should be acclimated in the room where they will be laid for at least 48 hours.

The floor should be laid at room temperature from +64.4°F to +75.2°F (+18°C to +24°C) and relative humidity between 45% and 60%.

Do not install the floor if the moisture content of the underlay and the relative humidity exceed the acceptable levels!

Always follow the instructions of the glue manufacturer during the installation. The glue coverage rate, the correct primer and trowel should be indicated by the glue manufacturer.

Choose the direction of boards in the installation area.

Work out of several boxes at a time to ensure an even color and shade distribution over the whole floor.

Do not use boards which show visible signs of damage! Return them to your retailer for replacement!

Complaints concerning boards with visible damage which have been installed will not be accepted!

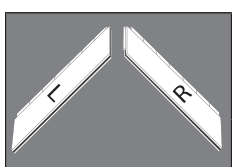
When working in rooms being renovated, remove all existing skirting boards or plinths. Make an off-cut in the door frames. Remove the existing thresholds and strips from the frames. You can replace these elements after the floor has been installed.

When making an off-cut in the door frame, the fitter should make sure that there is the recommended expansion gap. The floor must have a clearance of 1/16 inch under the door frame to allow free lifting without vertical restrictions. The fitter should ensure that the board under the door frame can move freely.

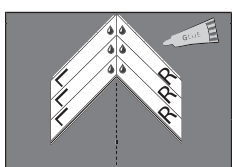
Do not directly use rubber hammers on the installed floorboards to avoid non-removable marks on the surface of the boards! Avoid walking on recently installed boards for at least 12 hours. Avoid walking on recently installed boards for at least 24 hours.

#### Floor installation procedure for Chevron:

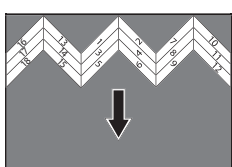
Before installation use putty knife to remove any residues from the substrate. Vacuum or sweep the surface.



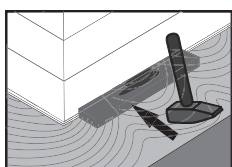
In the package you have left and right boards.



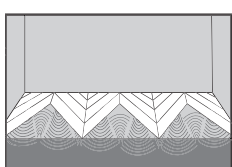
Divide the room in half and start assembling. Glue the first three rows of boards at the edges. When installing, make sure that the grooves of the boards are facing in the direction of the chevron arrangement. Remember about the 7/16" (10 mm) wall expansion joint.



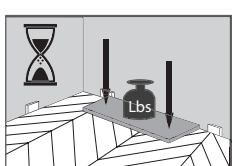
Cut the boards to size and assemble according to the numbering as shown in the picture. Place the boards symmetrically to the walls.



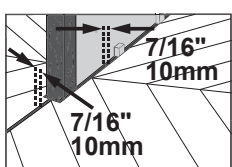
During the installation use a tapping block and a hammer to fit in the boards together along the longer edge. Adjust the tapping block along the entire longer edge of the board and tap it with hammer



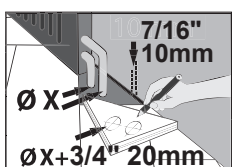
Apply it to a small area of the substrate so that the boards can be installed in time.



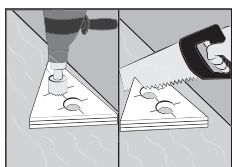
The boards which are glued down to the surfaces have to be weighted while the glue is drying, using for example the packs with the floor.



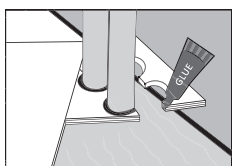
Remember about the 7/16" (10 mm) wall and door expansion joint



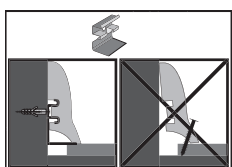
In case of pipes or other obstacles, cut out holes with a diameter increased by 3/4" (20 mm)



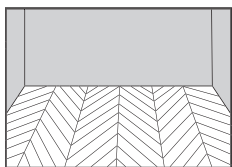
Cut the holes and then cut with the saw along the line as shown in the figure



Glue the cut spot



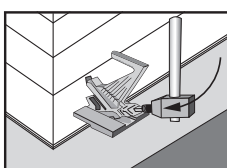
Install the skirting boards only to the wall, never to the floor! Remove all expansion wedges before starting the installation of skirting boards



Once the skirting boards have been installed, the floor is ready for use.

If the floor is to be covered/secured, use breathable material such as regular or corrugated cardboard. Do not cover the floor with plastic materials, e.g. foil. For the product warranty and the floor care and maintenance guide, see [www.hardwood-installation.eu](http://www.hardwood-installation.eu). After the skirting boards have been installed, the floor is ready for use.

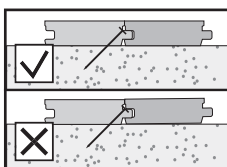
#### 4. STAPLE-DOWN INSTALLATION



#### Recommended tools and materials for floor installation:

- Pneumatic stapler
- Zinc-plated staples of length 1.5" (38 mm)

After the first floor row has been laid, fix the board tongue to the wooden substrate using 1.5" (38mm) staples. The spacing between staples should be about 8" (20 cm). The staples should go through the groove of the lock along the longer edge at an angle of about 45°



After installing the entire second row, side-nail boards every 8" (200 mm) or minimum of three nails/cleats per floorboard. Nail/staple through tongue. Nails/staples must be set just below surface of tongue. Adjust compressor if necessary.

**Important:** If side-nail must be removed after setting, use extreme caution. Do not pull the side-nail straight out of the tongue as edge and surface of board may be damaged. If the nail gun is not correctly positioned problems with nails that are not completely lowered can appear. If the nails are inserted at an incorrect angle, problems with shattered fibers from the finish cut surface can appear. In both cases, the result will be that the next board cannot be installed correctly. Shattered fibers can be removed by scraping with a knife, and nails have to be lowered completely manually.

If the floor is to be covered/secured, use breathable material such as regular or corrugated cardboard. Do not cover the floor with plastic materials, e.g. foil. For the product warranty and the floor care and maintenance guide, see [mullergraef.net](http://mullergraef.net). After the skirting boards have been installed, the floor is ready for use.

#### 5. HOW TO USE HARDWOOD FLOOR

The floor is factory finished and ready for use immediately after installation. However, remember that it is a 100% natural product made from wood, and water and sand are the biggest enemies of hardwood floors. The recommendations in this section are in accordance with the requirements for compliance with the warranty conditions and they will help to extend the service life of hardwood floor.

#### Requirements for use of hardwood floors

The high-quality hardwood floors are made of real wood. The floors provide superior performance and an excellent aesthetic finish. The warranty is available only if the floor is laid and used in accordance with guidance:

- The temperature in the area where the hardwood floor will be used should be from +64.4°F to 75.2°F (+18°C to +24°C). The relative humidity in the area should be kept between 45% and 60%.
- The maximum temperature at the surface of the boards installed over underfloor heating should not exceed 84°F (29°C). Do not use professionally installed carpets, runners, or furniture with legs of height less than 4" (10 cm) on floors laid over underfloor heating. However small accent rugs are allowed.
- Floor maintenance should be carried out using only the floor care products designed for this purpose. Instructions on how to take care of the floor and the maintenance schedule are provided on the packaging of the floor care products.
- Immediately remove any spills.
- Vacuum or sweep the floor to remove any particles which could scratch the floor. Caution: Never use vacuum cleaners with rotary brush which could cause damage to the floor.
- Do not use high-pressure jet-washers or steam to clean the floor.
- Walking in unsuitable footwear can damage the floor, causing e.g. black marks or indentations on the surface of the boards.
- Trim claws of your pets to prevent floor damage.
- Do not move or roll any heavy furniture or equipment over the floor.
- Using floor care products other than those recommended by producer may cause damage to the lacquer layer, color and gloss changes, spots and stains, and changes in the floor traction properties.
- The daily care and maintenance procedure should be limited to normal floor vacuuming or sweeping.
- Do not soak the floor or wash it with a wet mop. Apply the floor cleaner to the mop and not to the floor.
- Water may cause damage to your hardwood floor. Never use oil- or wax-base soap or liquid detergents on lacquered flooring. Clean the floor by mopping the floor forwards and backwards. When the mop is dirty, replace it with a lean one. Cleaning the floor with dirty mop may cause streaks.
- The frequency of floor care depends on the amount of traffic.
- Any sand or stones tracked onto the floor should be removed as soon as possible. Sand will leave scratches in the lacquer layer, small indentations and marks in the top layer of wood.
- Install barrier matting at, the entrance points (entrance doors, terrace doors, etc.) of your new hardwood flooring to effectively prevent the spread of unwanted sand, grit, water, dirt and soil which can tracked on shoes.
- Use dry and soft brushes or a vacuum cleaner with soft brush to remove dust. You can also use a slightly damp cloth with or without the recommended agent for floor care and maintenance. Under no circumstances should any wet traces remain on the floor after cleaning.
- All furniture and other equipment which remain in contact with the floor should be provided with protective felt pads which should be replaced at regular intervals.
- Armchairs and other furniture items with wheels must be used on protective plastic mats, floor coverings or rugs to protect hardwood floor from mechanical damage. Check and immediately remove any sand or other particles which could be tracked under the protective mat. Failure to remove such residues can cause scratches to the lacquer layer under the protective mat. Castors in office chairs or castor furniture should be replaced with castors designed for hardwood floors (in accordance with DIN-EN 12529, it is recommended using castors with Shore hardness equal 40-50 and surface pressure 3-5 N/mm²).
- Under no circumstances should hardwood floor be covered with PE foil or other moisture and air-tight materials.
- Multi-layer hardwood floor exposed to sunlight (UV light) will change its original color
- The floor can be refinished by sanding and re-lacquering or re-oiling. The producer allows floor refinishing using lacquers or designed for hardwood floors, provided that they are applied in accordance with the relevant directions for use. The number of floor renovations consisting in "removing" the surface layer of wood depends on the depth of mechanical damage. Before starting any mechanical refinish procedure (sanding or grinding), analyze the condition of the floor and determine if the floor can be refinished by mechanical methods.
- If the floor needs to be refinished by mechanical methods, it should be done by a professional flooring company.
- Any failure to comply with the above recommendations and instructions will void the material and workmanship warranty.
- Before fitting multi-layer boards over underfloor heating, the developer should perform the subfloor heat-up procedure in accordance with the "Subfloor Heat-up Specifications". A completed and signed "Subfloor Heat-up Specifications" is attached as an annex to the Warranty Certificate. If the heat-up report is absent, it will void the warranty for the floorboards laid over underfloor heating.
- For information on the installation of multi-layer floorboards over underfloor heating, see the installation guide.
- **IMPORTANT:** The user/developer, fitter or technician is required to make sure that individuals responsible for the cleaning the floor are made aware of the above "Instructions on how to use and take care of lacquered or oiled multi-layer floors".

NOTE: Floorboards are produced exclusively from genuine wood. Because of the natural variation in the raw material, the individual floorboards and their surface may differ in color, shade, the intensity of knots and grain pattern. Sample boards, samples, photographs and merchandising brochures may not fully correspond to the actual appearance of the products. The color of the product delivered may be different from the material available at the point of sale.

