FEBRUARY 2017

Kährs®
QUALITY IN WOOD SINCE 1857

SUBFLOOR AND INSTALLATION PREPARATION INSTRUCTIONS

Applicable to:

ALL Products

Kährs
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Approved Commercial Uses

Kährs flooring may be used as a floor covering in public or private business, educational or religious buildings and offices.

Installation in any and all areas where food or drinks are consumed, or areas contiguous to outside entrances must be coated with a compatible wood finish urethane, in accordance with the finish manufacturers application procedures. Kährs recommends contacting either Arboritec 877-416-5972 (arboritec.com) or Bona Kemi 1-800-574-4674 (bona.com) for details.

Kährs does not warranty the performance of any site-applied finish. Please contact the finish manufacturer for suitable products, procedures, and warranty.

Maintenance
See Kährs Commercial Flooring Maintenance Procedures (Kährs Commercial Warranty) for maintenance details (available at kahrs.com).

For prefinished oiled floors, please refer to Natural Oiled Floors Maintenance and Renovation Procedures at kahrs.com.

Subfloor Preparation

Note: Warranty coverage may be lost due to failure to strictly follow all installation instructions and recommendations and/or the use of improper materials or tools. **READ ALL INSTRUCTIONS CAREFULLY!**

Subfloor Specifications

A. The surface of the subfloor must be level to within 1/8" in an 8ft. radius. Check this by using the edge of a Kährs or Linnea plank to find high/low spots. To fill excessive voids or variations in the subfloor, use leveling compounds approved for your application. Consult the compound manufacturer to be sure it is appropriate. Allow the compound to dry thoroughly before beginning wood floor installation.
Fifteen-pound felt or roofing paper is also appropriate to level a floor for a float-in installation. Cut small pieces to fit the shape of the depression and then stack as many sheets as necessary to level the area. DO NOT us this method to correct extensive variations in concrete subfloors.

B. **You must** test concrete subfloors prior to installation by one of the following methods. Concrete subfloors must not contain more than 3 lbs. moisture on a dry-weight basis (calcium chloride test). Subfloor must read 4.5 or less with Tramex meter. Follow ASTM2170 - subfloor relative humidity not to exceed 75% with in-situ probe. Moisture content of wood subfloors must be less than 12% Moisture Content (MC). Document and keep ALL test results. Subsequent excessive moisture after pre-installation documented testing is evidence of moisture intrusion and will not be covered under Kährs warranty.

C. The subfloor must be clean.

D. Relative humidity at the job site must be, and remain, minimum 30%, maximum 60%. Temperature setting must be, and remain, within 15º F of normal operating range.

Evaluation

Before installing a Kährs floor, inspect the job site thoroughly. With the help of the Installation Environment Chart determine if grade, subfloor, and subfloor conditions are acceptable for the installation method you plan to use.

Exterior: Carefully inspect the outside surroundings for improper drainage and predictable or obvious sources of moisture. The yard should be graded (at least 6" in 10 ft.) to slope away from the foundation. Be sure that gutters and eaves sufficiently prevent rain from penetrating the foundation.

Under the house: In homes with crawl space or pier-beam foundations, foundation vents must provide cross-ventilation with no dead air space. Vents should be located throughout the foundation with opening area equal to 1-1/2% of the square-foot area within the crawl space (eg. a 1000sq. ft. crawl space must have 15 sq. ft. of vents that remain open all year). If excessive moisture exists underneath the house, you must lay a 6 mil black polyethylene moisture barrier on the ground in the crawl space below the installation area.

Interior: Check the moisture content of the subfloor. See item "B" above as well as "Moisture" at the end of this section. Room conditions can also indicate high moisture and relative humidity. Look for water stains, peeled paint near windows and doors, and rusty metal, especially nails.

Preparation

Wood Subfloors: Moisture Content (MC) must be less than 12%. To prepare the subfloor for installation, re-nail any loose areas with squeaks. Sand or plane any high spots and fill any low areas The subfloor should not vary more than 1/8" in an 8' radius. Check this by using the edge of a Kährs or Linnea plank to find any high or low spots. See Installation Environmental Chart for Approved Subfloors.

Subfloor Preparation

Preparation - continued

Preferred Subflooring: 3/4" (23/32", 18.3 mm) CDX grade plywood subfloor/underlayment 4' x 8' sheets OR 3/4" (23/32" 18.3mm) OSB subfloor/underlayment grade, with joint spacing 19.2" (475mm) on center joint construction or less. Direct Glue-Down installations: 2 layers 1/2" (11.9mm) CDX plywood.

Minimum Subflooring: 5/8" (19/32", 15.2mm) CDX plywood subfloor/underlayment 4' x 8' sheets, maximum 16" (400mm) on center joint construction. Direct Glue-Down installations: 2 layers 3/8" (10mm) CDX plywood.

Follow panel manufacturer recommendations for spacing and fastening. Typical panel spacing for joint systems is 1/8" (3.2mm) around perimeter and fastened every 6" (150mm) on bearing edges and every 12" (300mm) along intermediate supports.

Door casing should be notched or undercut to avoid difficult scribe cuts,

If nailing/stapling the floor, (Kährs 10mm thru 20mm Traditional Tongue & Groove or Woodloc®) we suggest you cover the sub floor with 15 lbs. or higher asphalt felt to retard moisture and to help alleviate variations in the subfloor.

Concrete Subfloors: Lightweight (float-in only) and standard-density (float-in and glue-down concrete subfloors are ideal applications for a Kährs floor. Concrete subfloors are generally acceptable for float-in installation if the subfloor appears to be dry (i.e. no standing water or discoloration of concrete) and Kährs Combo System Underlayment is used and installed properly. Be sure that, as a minimum, any concrete subfloor is at least 50-60 days old before installing a wood floor over it.

Moisture

To curb the adverse effects moisture will have on a Kährs wood floor and to determine the source of moisture problems, use the following checklist:

1. Inspect the gutters, drains, and down spouts outside the house. Clear out any clogs caused by leaves, dirt, or other substances. Down spouts are designed to transport water away from a foundation.
2. Check the landscaping surrounding the home to be sure the yard is sloped away from the foundation (at least 6" in 10 ft.).
3. Check windows and doors for proper drainage and waterproof caulking.
4. Inspect concrete subfloor for cracks or buckling. Sometimes the water table (water beneath the sur face) may rise and force water up through the concrete floor with hydrostatic pressure.
5. Check the ventilation system in the crawl space, basement, and attic. Moisture will collect on walls and floors if dead air (i.e. little or no ventilation) is present. As a rule, ventilation per sq. ft. should equal 1-1/2% of the sq. ft. of the area in question.
6. Inspect pipes, water heater tank, dishwasher, and any other plumbing fixtures in the affected area.
7. Remember to take seasonal changes in relative humidity into consideration when installing a Kährs floor.
8. Signs that the moisture content is too high include discolored (darker) concrete and evidence of actual water droplets.

Moisture - continued

Required moisture testing for ALL Kährs radiant heat installations and direct glue-down flooring: Calcium Chloride test with a reading of 3 lbs. or less on a dry weight basis (2 lbs. or less for Radiant Heat Installations). Testing kits are generally available through your distributor or call the NWFA at 800-422-4556 (or 800-848-8824 in Canada) for the source nearest you. Follow test kit manufacturer's instructions for conducting test and measuring results.

• Concrete Moisture Barrier System*

* If moisture is present an alternative is a barrier of inexpensive sheet vinyl or "slip sheet" (PVC). Use the manufacturers recommended adhesive for a full spread application to completely adhere the vinyl to the subfloor. Since Kährs cannot guarantee the bond of the vinyl to the subfloor, or subsequent performance of the vinyl, a patch test is strongly advised. Install several 3" x 3" pieces of vinyl in different areas of the installation. Wait 72 hours. Remove the vinyl. If the backing remains attached to the concrete, the subfloor should be acceptable for full spread vinyl installation.
Note: Concrete sealers are typically **NOT** approved for Radiant Heat installations.

Other Subfloors: Kährs floors can be installed directly over some existing floors (i.e. vinyl and rubber tile, steel plates, terrazzo, and existing wood floors). The subfloor or existing floor must meet the requirements listed in "Subfloor Specifications." A Kährs floor installed over existing floors must be installed with the float-in method.

Installation Environment Chart			
I. Grade Type	**Glue****	**Staple***	**Float**
Above Grade	Yes	Yes	Yes
On Grade	Yes	Yes	Yes
Below Grade	Call First	No	Yes
Over Radiant Subfloor	Call First	No	Yes
II. Subfloor Type	**Glue****	**Staple***	**Float**
Concrete (701lbs ft^3 density or higher)	Yes	No	Yes
Light-weight concrete	No	No	Yes
Association grade underlayment plywood	Yes	Yes	Yes
Association grade underlayment particle brd	Yes	No	Yes
Stamped Underlayment Grade OSB	Yes	Yes	Yes
Old wood floors - above grade	No	No	Yes
Asphalt Tile	No	No	Yes
Inlaid linoleum	***	No	Yes
Vinyl asbestos tile	No	No	Yes
Cushion vinyl	No	No	Yes
Rubber tile	No	No	Yes
Solid vinyl tile	No	No	Yes
Steel	No	No	Yes
Marble	No	No	Yes
Ceramic	No	No	Yes
Carpet	No	No	No

*20mm T&G refer to traditional T&G nail down installation instructions
***Check Kährs Technical Services Department: 1-800-ASK-KAHR

Calculation Worksheet for Minimum Board Width (US Standard)

Purpose: To ensure last board of the installation (or long board at an obstruction) is not too narrow.
General Rule: Kährs requires that no board have a width less than 3" or .38" of a full board width.
Notes on Equation: This rule applies to boards with an original thickness of 5/8" x 3-strip wide. This equation should be used when a board 4' or more in length meets an obstruction.

Worksheet

Step 1
Measure width of connected area* from starting wall to finish wall or obstruction, in inches. Round to the nearest 1/4".

Connected Area Width in inches with fraction: _____

Step 2
Convert "inches with Fraction" to "Inches with Decimal". Use conversion chart below.

Connected Area Width in inches with decimal: _____

Step 3
Multiply "Required Expansion Space by 2. Use chart below.

Total Expansion Needed from above: _____

Connected Area Width (from Step 2)	Expansion Space		Total
Under 144"	1/4"	x 2 =	.50"
144" - 288"	1/2"	x 2 =	1.0"
288" - 480"	3/4"	x 2 =	1.5"

Step 4
Subtract Total Expansion Needed from Connected Area Width to determine Actual Floor Width.
Total from Step 2: _____ "
Total from Step 3: - _____ "
Actual Floor Width in inches with decimal: = _____ "

Step 5
Determine total # of rows of flooring needed.
Actual Floor Width (Step 4): _____ "
Board Width in Decimal - measure board and use chart below to convert: ÷ _____ "
Total Rows of Flooring: = _____ rows

Step 6
If the result in Step 6 contains a decimal less than .38", you must rip the starting row in half to ensure proper width of the last row.

Example

Step 1
Measure width of connected area* from starting wall to finish wall or obstruction, in inches. Round to the nearest 1/4".

Connected Area Width in inches with fraction: 325 1/4"

Step 2
Convert "inches with Fraction" to "Inches with Decimal". Use conversion chart below.

Connected Area Width in inches with decimal: 325.25"

Step 3
Multiply "Required Expansion Space by 2. Use chart below.

Total Expansion Needed from above: 1.5"

Connected Area Width (from Step 2)	Expansion Space		Total
Under 144"	1/4"	x 2 =	.50"
144" - 288"	1/2"	x 2 =	1.0"
288" - 480"	3/4"	x 2 =	1.5"

Step 4
Subtract Total Expansion Needed from Connected Area Width to determine Actual Floor Width.
Total from Step 2: 325.25"
Total from Step 3: - 1.50"
Actual Floor Width in inches with decimal: = 323.75"

Step 5
Determine total # of rows of flooring needed.
Actual Floor Width (Step 4): 323.75"
Board Width in Decimal - measure board and use chart below to convert: ÷ 7.875"
Total Rows of Flooring: = 41.11 rows*
**The First board in this installation would be ripped in half.*

Step 6
If the result in Step 6 contains a decimal less than .38", you must rip the starting row in half to ensure proper width of the last row. *Ripping the starting row in half will increase the last board width by .50 of a board. In this case the last board will end up being .61 of a board or approx. 5", instead of .11 or 1" wide.*

*From Step 1 - **Connected Area** is defined as all areas connected without a break. If Room **A** and Room **B** both are to have flooring installed and are directly connected, or connected by a hallway, without a t-molding, the **connected area** is the width of both Room **A** and Room **B**, and the hallway (if applicable). Obstructions can include cabinets, islands, and the wall opposite the starting wall in the same room, if the flooring continues to another room without a break. Multiple calculations may need to be made to best determine the amount cut from the starting row.

Calculation Worksheet for Minimum Board Width (Metric)

Purpose: To ensure last board of the installation (or long board at an obstruction) is not too narrow.
General Rule: Kährs requires that no board have a width less than 76mm or .38" of a full board width.
Notes on Equation: This rule applies to boards with an original thickness of 15mm x 3-strip wide. This equation should be used when a board 120cm or more in length meets an obstruction.

Worksheet

Step 1
Measure width of connected area* from starting wall to finish wall or obstruction, in mm.

Total Area Width in mm: _____

Step 2
Multiply "Required Expansion Space by 2. Use chart below.

Required Expansion Space: _____
x 2
Total Expansion = _____

Connected Area Width	Expansion Space		Total
Under 144"	10mm	x 2 =	20mm
144" - 288"	15mm	x 2 =	30mm
288" - 480"	20mm	x 2 =	40mm

Step 3
Subtract Total Expansion from Total Area Width to determine Actual Floor Width.
Total from Step 1: _____
Total from Step 2: - _____
Actual Floor Width: = _____

Step 4
Determine total # of rows of flooring needed.
Actual Floor Width (Step 4): _____
Board Width: ÷ _____
Total Rows of Flooring: = _____

Step 5
If the result in Step 4 contains a decimal less than .38", you must rip the starting row in half to ensure proper width of the last row.

Example

Step 1
Measure width of connected area* from starting wall to finish wall or obstruction, in mm.

Total Area Width in mm: 8262 mm

Step 2
Multiply "Required Expansion Space by 2. Use chart below.

Required Expansion Space: 20 mm
x 2
Total Expansion = 40 mm

Connected Area Width	Expansion Space		Total
Under 144"	10mm	x 2 =	20mm
144" - 288"	15mm	x 2 =	30mm
288" - 480"	20mm	x 2 =	40mm

Step 3
Subtract Total Expansion from Total Area Width to determine Actual Floor Width.
Total from Step 1: 8262 mm
Total from Step 2: - 40 mm
Actual Floor Width: = 8222 mm

Step 4
Determine total # of rows of flooring needed.
Actual Floor Width (Step 4): 8222 mm
Board Width: ÷ 200 mm
Total Rows of Flooring: = 41.11 rows*
**The First board in this installation would be ripped in half.*

Step 5
If the result in Step 4 contains a decimal less than .38", you must rip the starting row in half to ensure proper width of the last row. *Ripping the starting row in half will increase the last board width by .50 of a board. In this case the last board will end up being .61 of a board or approx. 120mm, instead of .11 or 22mm wide.*

*From Step 1 - **Connected Area** is defined as all areas connected without a break. If Room **A** and Room **B** both are to have flooring installed and are directly connected, or connected by a hallway, without a t-molding, the **connected area** is the width of both Room **A** and Room **B**, and the hallway (if applicable). Obstructions can include cabinets, islands, and the wall opposite the starting wall in the same room, if the flooring continues to another room without a break. Multiple calculations may need to be made to best determine the amount cut from the starting row.

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