

# NEW ERA UNOBAT SPORTS FLOOR SPECIFIER'S AND INSTALLATION INSTRUCTIONS

## INFORMATION NEW ERA UNOBAT

D 1.0	General information Junckers sports floors
D 10.2	Specifier's- and Installation Instructions

**Table 1**

## 1. SYSTEM SPECIFICATION

The New Era Unobat Sports Floor System is based on 22 mm solid hardwood floorboards nailed to a resilient sub-floor of kiln dried softwood battens placed in adjustable polypropylene cradles incorporating a foam base.

Polypropylene New Era packing pieces are placed into the top of the cradle beneath the battens to level out undulations in the sub-floor.

**Batten sizes:** 22x45x2400 mm, 36x45x1800 mm, 48x45x1800 mm or 63x45x2100 mm.

### Sub-floor:

The New Era Unobat Floor System is installed on a dry, load bearing sub-floor of concrete, lightweight concrete, timber or it may be possible to install on top of the existing floor finish. The floor system does not require a sub-floor produced to a tight flatness tolerance and can eliminate the need for a screed.

### Cradles:

The cradles are available in a wide range of heights to cater for most level deviations. A maximum of 15 mm packing can be placed into each cradle before the next size cradle is required (Max. 12 mm packing for S Zero cradles and 22 mm battens).

### Batten distance of 411mm centres:

Cradles are spaced at 300 mm centres when using the 22x45 mm batten, 450 mm centres when using the 36x45 mm batten, 600 mm centres when using the 48x45 mm batten and at 700 mm centres when using the 63x45 mm batten.

Batten centres and cradle centres can be reduced to strengthen the undercarriage for use with retractable seating units etc. Please contact Junckers Technical Department for more information.

**Underfloor heating:** This floor system can also accommodate under floor heating which is suspended between batten rows.

### Constructions height:

The minimum construction height is 60 mm to a maximum of 449 mm. Refer to page 5/5 showing all system heights including breakdown of components.

### Performance:

The floor system is an area elastic type of sports floor with high shock absorbency combined with a high ball bounce, which makes it suitable for fast ball games as well as in multipurpose sports halls. The system fully conforms to EN 14904 Class A4. (A3 for 63 mm thick battens).

### Step sound reduction values when installed on a high mass structural base:

Residential and commercial floors, 36 mm battens: 27dB.

Residential and commercial floors, 48 mm battens: 28dB.

Sports Floors: 25dB.

For general information on sound and practical guidelines on acoustics in floor constructions with Junckers hardwood floors see E 5.0.

**Read all information:** Please note that full documentation of this floor system comprises General information, Specifier's and Installation instructions, see table 1. For further information, please contact Junckers Technical Service.

## 2. FLOOR COMPONENTS - NEW ERA UNOBAT SPORTS FLOOR

1. **Junckers 2-strip solid hardwood floorboards for sport**

Thickness x width x length  
 22x129x3700 mm

Wood Species, grade and surface:  
 See data sheet B 2.0

2. **Nails**

2.2x45 mm machine J-nails or 50 mm Portanails

3. **New Era Unobat Batten**

22x45x2400 mm  
 36x45x1800 mm  
 48x45x1800 mm  
 63x45x2100 mm

Batten distance: c/c 411.1 mm

4. **Cradles**

Polypropylene in various sizes incorporating 10 mm thick Evazote polyethylene foam pad.  
 Polypropylene packing pieces: 1.5, 3, 6 and 12 mm.

5. **SylvaThene moisture barrier**

0.20 mm PE membrane.

6. **Distance to wall**

1.5 mm per running metre across width and 1 mm per running metre along length of the floor, but both min. 15 mm. Is also required at fixed points, e.g. columns.

7. **Combi sports skirting 38x48 mm**

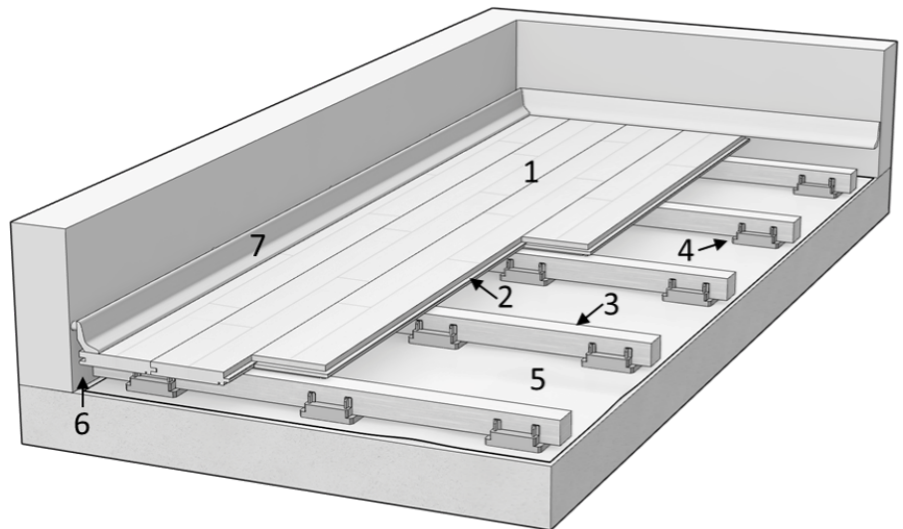


Fig. 1

### 3. RIGIDITY AND LOAD-BEARING STRENGTH

The New Era Unobat Sports Floor System is designed to bear the expected loads in connection with sports and similar activities. Table 2 shows the tested and approved maximum point load-bearing strength at certain load areas and batten distance. In a heavy load situation, e.g. back stop units, stages or retractable seating, it may be necessary to decrease batten centres. For further information contact Junckers Technical Department.

Table 2		
Batten distance c/c 411	Diameter, 25 mm: 3.5 kN (≈ 350 kg)	100 x 100 mm: 4.5 kN (≈ 450 kg)

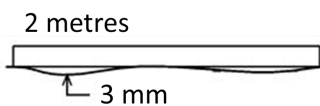
Table 3 shows the floor system in relation to the load classes in ENV 1991-2-1:1995, where the load-bearing strength requirements are complied with and the floor has an acceptable rigidity. The floor system's rigidity in relation to wheel loads is also shown.

For further definition of load classes and types, see technical information sheet, D 1.0 - Stiffness and load bearing strength of floors.

Table 3	Loading types	
	Area- and Point load	Wheel load
Loading category		
C4: Assembly halls for physical activity, e.g. gyms/theatres	Approved*	Approved**
C5: Assembly halls which can be crowded, e.g. sports halls incl. stands.	Approved*	Approved**

\* Point load area min. 200 x 200 mm

\*\* Wheel loads, see D 1.0 - Table 2



### 4. FLATNESS OF THE SUBFLOOR

The subfloor must be levelled so that any deviations in flatness do not conflict with the requirements below.

The subfloor must be flat with a maximum deviation of 3 mm under a 2 m straight edge.

Deviations are measured as gaps under the straight edge. The surface must be smooth. Any irregularities must be corrected by grinding or by using a self levelling compound.

### 5. THE 10-BOARD RULE - AVOID STRESS AND GAPS

In order to minimize stress or gaps in the floor due to fluctuations in the climatic conditions within the building, floorboards must be laid according to a 10-board rule.

This indicates the measurement across 10 floorboards when laid and should be checked continuously during the installation and afterwards, see Fig. 2.

To keep the 10-board measurement (10 BM), it is recommended to use Junckers temporary spacers during installation of the floor. Spacers are delivered in a range of sizes to suit the expected relative humidity of the room.

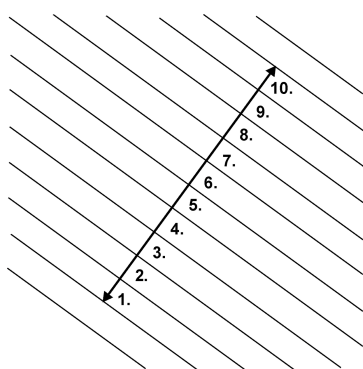
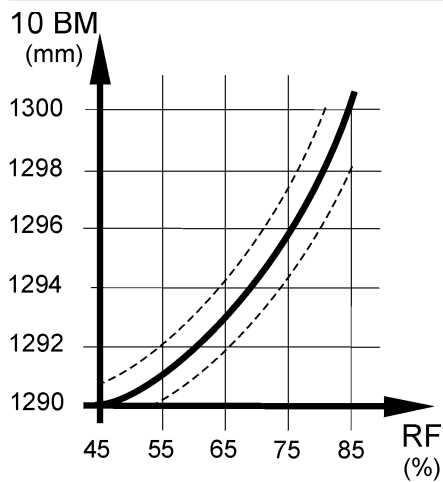


Fig. 2



The 10-board measurement is chosen on the basis of the expected maximum relative humidity in the building when in use throughout the year, see fig. 3

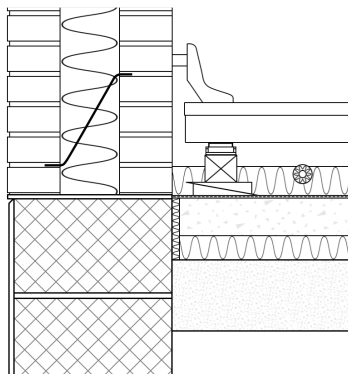
The graph in fig. 3 illustrates the 10-board rule in relation to the relative air humidity for 129 mm floorboards. E.g. an expected relative humidity of max. 65 % RH will normally require a 10- board measurement of approx. 1294 mm.

The outer limits of the 10-board measurement, which also depend on the floor size, are marked with dotted lines.

The size of the floor area, as well as it's location, i.e. ground floor or horizontal division, may also have influence on the choice of the 10-board measurement.

For further information please contact Junckers technical department.

Fig. 3



## 6. THERMAL INSULATION AND PIPES IN THE SUBFLOOR

The batten system provides good opportunity to incorporate thermal insulation.

There must be sufficient ventilation gap between the underside of the floorboards and the insulation. This is to prevent fungal growth.

All central heating, cold and hot-water pipes under floors must be carefully insulated using at least 20 mm mineral wool or similar.

It must be ensured that there is a sufficient space between underneath of the floorboard/batten and the pipe insulation to allow for unimpeded vertical movement of the floor, see Fig. 4.

Fig. 4

## 7. MOISTURE PROTECTION

### Concrete subfloors

The residual moisture contained in the concrete or screed must not exceed 75 % RH when measured with a hygrometer in accordance with BS 8201 Annex A. At ground level and other upper levels, protection against moisture both from within the building and from the ground is required.

A moisture barrier must be provided by using Junckers SylvaThene, 200 micron polythene directly on the concrete before laying out the battens, see Fig. 4 (dotted line).

### Wooden subfloors

For renovation projects where new floor systems are laid on existing wooden subfloors, it must be ensured that the entire structure has been designed to the correct specifications regarding moisture protection and ventilation where required.

Usually, no additional moisture protection must be applied on top of the existing timber floor, as this may cause fungal attack in the subfloor.

## 8. UNDERFLOOR HEATING

Heating pipes will usually be installed in one of two ways with the New Era UnoBat system. Pipes may be clipped to the top of rigid insulation laid between the battens, or they will be supported in aluminium heat emission plates which are fixed to the top of the battens before the floorboards are laid. To ensure uniform heat distribution pipes should not be more than 300 mm apart. See fig. 5 and 6.

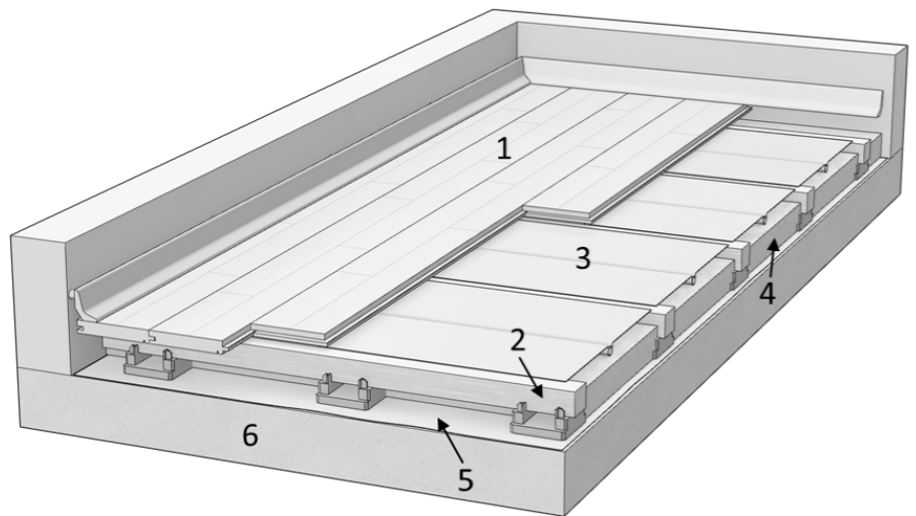
Prior to installation of the floor the moisture level in any screed or concrete base must not exceed 75 % RH as measured with a hygrometer to BS 8201 Annex A. Timber subfloors must have a moisture content between 10 % and 12 %.

The temperature on top of the Junckers floor board must not exceed 27 °C in order to minimize gapping during the heating season.

These instructions must be read in conjunction with Technical Data Sheet E 4.0 "Underfloor Heating; General Information".

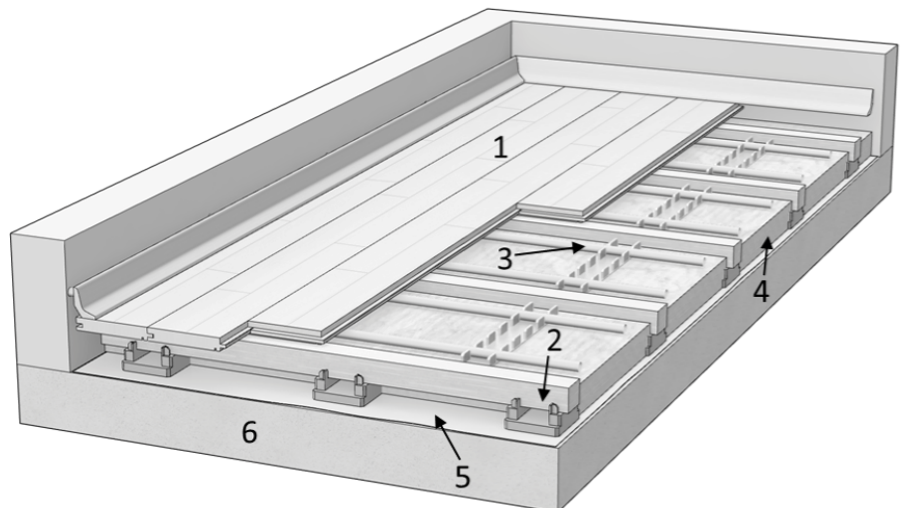
**Fig. 5, Heating pipes supported in aluminium heat emission plates fixed to the top of the battens**

1. Junckers 2-strip solid hardwood floorboards
2. New Era Batten and cradle system
3. Aluminium heat emission plates with hot water pipes
4. Insulation
5. SylvaThene moisture barrier 0.20 mm PE membrane.
6. Concrete slab



**Fig. 6, Heating pipes clipped to the top of rigid insulation laid between the battens**

1. Junckers 2-strip solid hardwood floorboards
2. New Era Batten and cradle system
3. Pipes clipped to the top of rigid insulation laid between the battens
4. Insulation
5. SylvaThene moisture barrier 0.20 mm PE membrane.
6. Concrete slab



## 9. CONSUMPTION OF MATERIALS

Net consumption for 1000 m<sup>2</sup> New Era Unobat batten system, batten distance 411mm.

Floorboards Machine J-nails, 2.2 x 45 mm 22x45 mm, 36x45 mm, 48x45 mm or 63x45 mm softwood battens	1000 m <sup>2</sup> + approx. 2 % 20000 pcs. 2700 m
New Era S Zero Cradles with 36 x 45 mm battens New Era Cradles with 36x45 mm battens New Era Cradles with 48x45 mm battens New Era Cradles with 63x45 mm battens (Packing pieces will be dependent on sub-floor survey)	10000 pcs. 6600 pcs. 5000 pcs. 4000 pcs.
Loose tongues SylvaThene moisture barrier, 0.20 mm PE membrane Sylvafix, to glue wooden pieces and loose tongues Combi sports skirting	67 pcs. 1100 m <sup>2</sup> incl. overlaps 15 bottles (15 x 0.75 litre) 2 x floor width and length

## 10. NEW ERA SYSTEM DETAILS

ULTRA SLIM SYSTEM - S ZERO CRADLE 22 mm floorboard with 22 mm batten Construction height (incl. floorboard)	Cradle centres	No of cradles per m <sup>2</sup> of flooring (411 mm batten centres)	Lin. metres of batten per m <sup>2</sup> of flooring (411 mm batten centres)
60 - 72 mm	300 mm	10 no	2.7 m

S 1 - 15 Cradles	22 mm floor with 36 mm batten	22 mm floor with 48 mm batten	22 mm floor with 63 mm batten
Cradle centres	450 mm	600 mm	700 mm
Cradles required pr. m <sup>2</sup>	6.6 no	5.0 no	4.5 no
Linear metres of batten pr. m <sup>2</sup> of flooring. (411 mm batten centres)	2.7 m	2.7 m	2.7 m
Dual Height Units	Construction height and packing range (incl. floor boards)		
S1	74-103 mm	86-115 mm	101-130 mm
S2	103-133 mm	115-145 mm	130-160 mm
S3	119-148 mm	131-160 mm	146-175 mm
S4	138-167 mm	150-179 mm	165-194 mm
S5	167-197 mm	179-209 mm	194-224 mm
S6	183-212 mm	195-224 mm	210-239 mm
S7	212-242 mm	224-254 mm	239-269 mm
S8	228-257 mm	240-269 mm	255-284 mm
S9	257-287 mm	269-299 mm	284-314 mm
S10	273-302 mm	285-314 mm	300-329 mm
S11	302-332 mm	314-344 mm	329-359 mm
S12	318-347 mm	330-359 mm	345-374 mm
S13	347-377 mm	359-389 mm	374-404 mm
S14	363-392 mm	375-404 mm	390-419 mm
S15	392-422 mm	404-434 mm	419-449 mm

**NOTE:** See under section "CRADLE COMPONENTS REQUIRED" for required components corresponding to the different heights.

## 11. CRADLE COMPONENTS REQUIRED

S Zero: 16 mm cradle

S1: 16 mm/31 mm dual height cradle

S2: 45 mm/60 mm dual height cradle

S3: 55 mm base, 6 mm/20 mm dual height top

S4: 74 mm base, 6 mm/20 mm dual height top

S5: 74 mm base, 35 mm/50 mm dual height top

S6: 74 mm base, 45 mm spacer, 6 mm/20 mm dual height top

S7: 74 mm base, 45 mm spacer, 35 mm/50 mm dual height top

S8: 74 mm base, 2x45 mm spacers, 6 mm/20 mm dual height top

S9: 74 mm base, 2x45 mm spacers, 35 mm/50 mm dual height top

S10: 74 mm base, 3x45 mm spacers, 6 mm/20 mm dual height top

S11: 74 mm base, 3x45 mm spacers, 35 mm/50 mm dual height top

S12: 74 mm base, 4x45 mm spacers, 6 mm/20 mm dual height top

S13: 74 mm base, 4x45 mm spacers, 35 mm/50 mm dual height top

S14: 74 mm base, 5x45 mm spacers, 6 mm/20 mm dual height top

S15: 74 mm base, 5x45 mm spacers, 35 mm/50 mm dual height top

## INSTALLATION INSTRUCTIONS

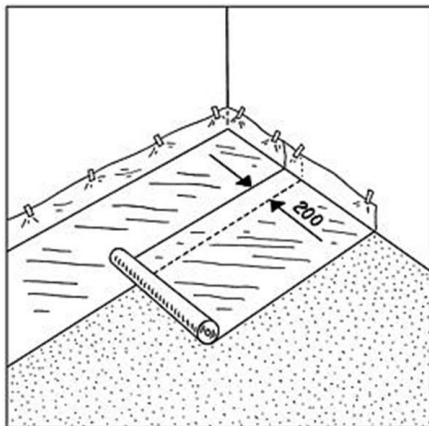
### WHEN TO START INSTALLATION

The building must be weather tight. The heating system must be installed and tested, and during the heating season there should be a constant heat supply.

Cast concrete elements, including casting of sockets for fixtures and fittings, screeding and other wet trades which can contribute moisture to the building, e.g. priming of paintwork, must also be completed.

The relative humidity in the building must be between 35-65 % RH and the temperature approx. 16-20 °C. The residual moisture contained in the concrete or screed must not exceed 75 % RH measured with a hygrometer according to BS 8201 Annex A. For timber sub floors the moisture content should not exceed 12 %.

Solid floorboards should always be laid immediately after arrival at the building. The wrapping of the floorboards must not be removed until just prior to laying the floor, i.e. no acclimatising of the floorboards on site must take place.

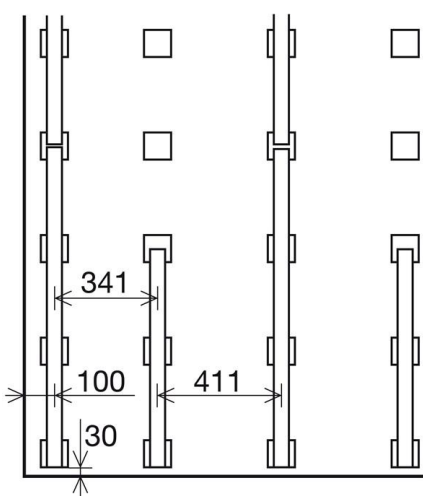


### 1. MOISTURE BARRIER

A moisture barrier of Junckers SylvaThene 0.20 mm PE membrane must be laid on all concrete and screed subfloors.

The moisture barrier must be laid with an overlap of 200 mm at all joints, continuing up walls etc.

The membrane must be taped with waterproof tape at all joints.



### 2. SUBSTRUCTURE - 411 MM BATTEN CENTRES

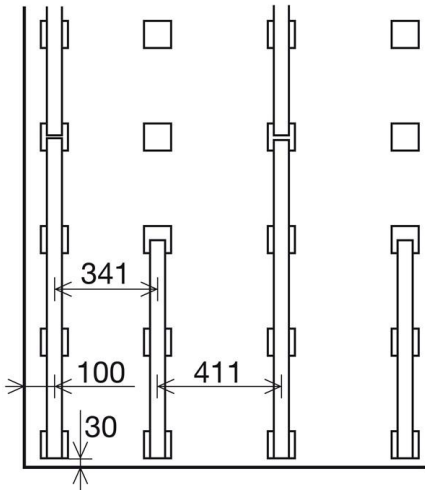
The battens and cradles are laid parallel to the shortest side of the room to ensure that the boards are laid parallel to the longest side of the room.

The first row of cradles is placed at 100 mm from the wall to the centre of the cradle. The second row is laid at 341 mm from the first row. All other rows are spaced at 411 mm centres apart from the last row which is again spaced at 100 mm centres from the wall.

At the end of each batten row the end of the cradle should be placed 30 mm from the wall. Batten ends within the floor must finish in the centre of a cradle. The exception is the first and last cradle of every row where the batten end is at the end of the cradle.

The second row of battens spaced at 341 mm centres is based on an expansion gap of 30 mm being left at the perimeter, which is the requirement for a 33mx18m sports hall. For smaller or larger floors please consult Junckers Ltd. for advice.





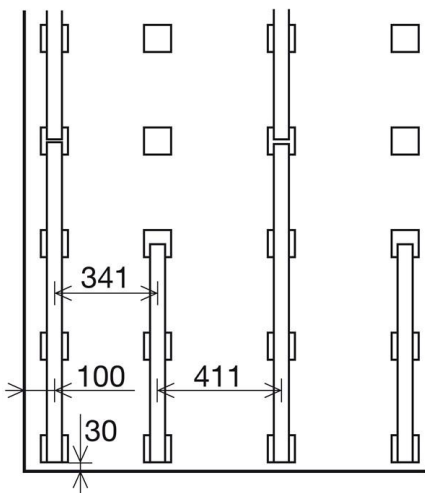
### 3. BATTEN END JOINTS MUST NOT BE IN LINE

Batten end joints must not be in line but must be staggered as much as possible.

Cradle centres along the batten:

- 22x45 mm batten: 300 mm
- 36x45 mm batten: 450 mm
- 48x45 mm batten: 600 mm
- 63x45 mm batten: 700 mm

The entire substructure must be placed with an expansion gap of minimum 30 mm from all walls, net posts, pipes, etc.



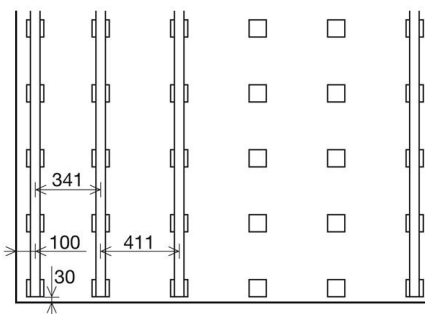
### 4. START ROWS

The first 3 rows of cradles should be set out at the correct spacing and then laser levelled into place using packing pieces which are placed into the top of the cradles.

Battens can then be placed in cradles.

The maximum permitted amount of packing per cradle is 15 mm before the next size cradle is required. (Max. 12 mm thick packing when the S Zero cradles are used)

The polypropylene packing pieces do not require gluing as they lock into place, except for the top packer which must be glued to the batten.



### 5. BATTEN CENTRES, REMAINING BATTENS

Remaining batten rows across the floor are spaced at 411 mm.

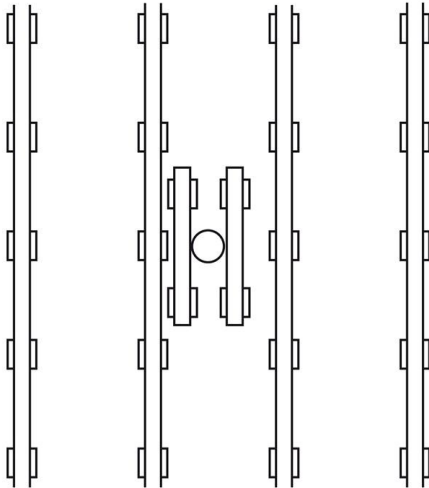
Regular levelled Datum rows should now be set out maintaining the 411 mm batten centres.

The distance of the datum rows will depend on the length of the straight edge used to span.

With the datum rows now in place the floor areas are effectively divided into bays and the floor is ready for the positioning and levelling of the remaining cradles to fill the bays.

**NB. The last row of cradles are spaced 100 mm from the wall to the centre of the cradle.**

It is recommended that the foam pads are removed from cradles positioned in doorways and beneath fixed stationary objects to avoid deflection in these areas. This recommendation will also apply where floor heating grills have to be accommodated.



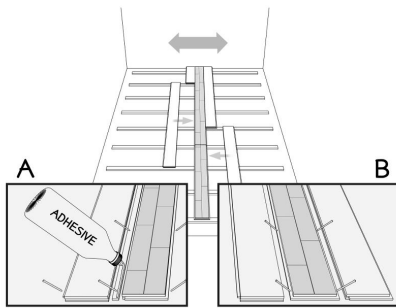
## 6. SUPPORT BATTENS

Place extra support battens and cradles (New Era UnoBat) at post-sockets, pipes etc.

The distance to walls net posts and pipes should be a minimum 30 mm.

### Squash courts:

For squash court floors permanent packing blocks comprising battens and New Era Cradles must be fitted between the front wall and the first row of battens to provide solid packing between the floor and front wall.

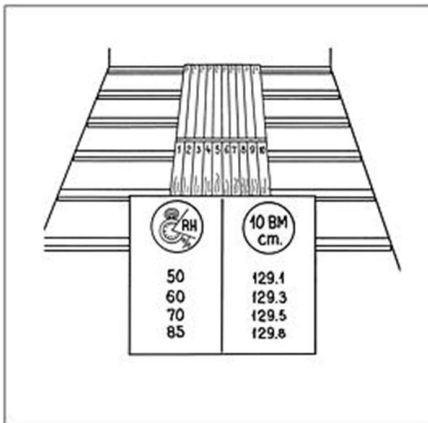


## 7. LAYING OF FLOORBOARDS

If the floor is more than 12 m wide the installation must begin in the middle of the sports hall. Use one of the following two methods:

- A. The two centre floorboards are joined with a loose tongue which must be glued to one of the floorboards in the full length of the floorboard.
- B. Use Junckers CenterRow boards. These floorboards are constructed with a tongue on both sides.

The floorboards are secret nailed, see part 10.



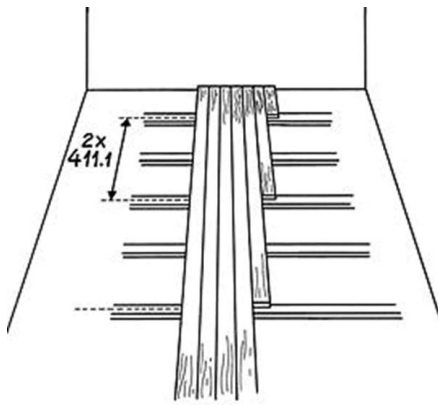
## 8. REMEMBER THE 10-BOARD RULE

In order to allow the floorboards to move in accordance with natural humidity changes in the building, the floorboards must be installed according to the 10-board rule which indicates the width measured across 10 floor boards. Compliance must be checked periodically during the installation process.

The 10-board rule is chosen on the basis of the maximum expected relative humidity of the building during the year, e.g. an expected relative humidity of max 65 % RH normally gives a 10-board measurement of approx. 1294 mm.

The 10-board measurement is achieved by placing plastic spacers between every row of floorboards during installation. Spacers are available from your Junckers distributor.

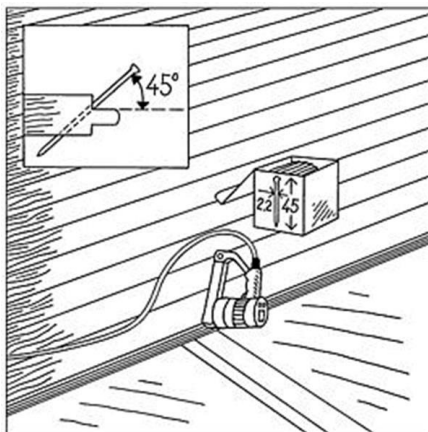
If in doubt, please contact Junckers Technical Department.



## 9. SUPPORT AND STAGGERING OF HEADER JOINTS

All floorboard header joints must be fully supported by battens and all floorboards must be laid in the pattern shown in the drawing.

**NB:** with a batten distance 411.1 mm, the distance between floorboard header joints in two consecutive rows must be  $2 \times 411.1 \text{ mm} = 822.2 \text{ mm}$ , as shown in the drawing.



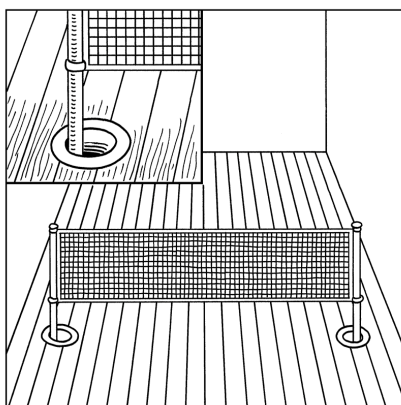
## 10. NAILING

To avoid creaking, the boards are pushed down on the battens while they are nailed.

Use Junckers machine J-nails, 2.2x45 mm or 50 mm Porta nails with pneumatic nail gun. The floorboards are secret nailed at an angle of 45°.

Do not nail closer than 50 mm to stave joints and never in the floorboard end joints.

**NB:** The first and last rows of floorboards installed must be face nailed or screwed and then covered with matching filler.

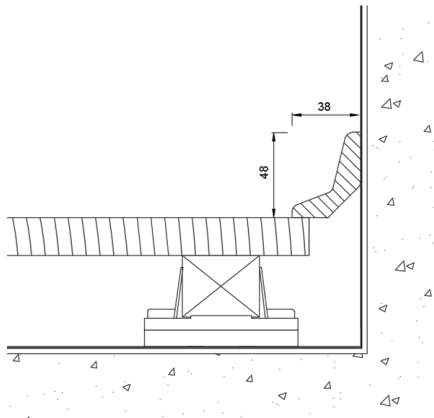


## 11. EXPANSION ALLOWANCES

The distance between the floorboards and walls/vertical fixed installations is calculated as 1.5 mm per running metre of floor width on each side, and at end walls 1 mm per running metre of floor length, with a minimum gap of 15 mm.

Bushings must be fitted so that both vertical and horizontal movement of the floor is unimpeded. The size of the internal opening of the bushing must exceed that of the post by minimum 40 mm. At the outermost edges of the floor all bushings are mounted eccentrically towards the centre of the floor in relation to the post-sockets in the concrete, so that the floor can expand freely.

Place extra support battens at net poles, pipes, etc



## 12. JUNCKERS COMBI SPORTS SKIRTING

The foot of the skirting must lie flat and be in contact with the floor. End joints may be either butt jointed together or 45° mitre the joints between sections to enhance the visual effect of the joint.

The skirting can be either glue fixed to the walls or screw fixed with cups and screws.

Do not fix the skirting to the Junckers floor and ensure that the skirting is not exerting any downward pressure on the floor.