

### Underfloor Heating

E 4.0 General information

**E 4.2 Batten System information**

#### Components in figure 3

##### 1 - Boards

- 22 mm boards
- 22 mm ship's decking
- 20.5 mm wide boards
- 20.5 mm ship's decking

nailed to bearers with:

- 2.6 x 65 mm T-nails (machine nails) in every third board or 450 mm c/c.  
NB! Hand nails should not be used.

##### 2 - Intermediate layer

- floor cardboard, 500 g/m<sup>2</sup>

##### 3 - Heat-distribution plates

##### 4 - Floor heating pipes

##### 5 - Bearers

- 25 x 100 mm planed on one side, c/c distance: 150 mm

##### 6 - Insulation

##### 7 - Battens/Joists

- Maximum c/c distances:  
Residential: 600 mm  
Commercial: 500 mm

##### 8 - Packing

##### 9 - Moisture barrier

- 0.15 mm PE membrane.

Fig. 2

### Introduction

These guidelines concern 22 mm solid boards and 20.5 mm solid wide boards nailed to battens, joists or a subfloor of bearers in which heating pipes are installed in heat-distribution plates.

Please note that full documentation of a floor system nailed to a wooden substructure with a built-in underfloor heating system comprises the data in E 4.0 and E 4.2.

Reference is also made to Junckers Batten System. → C 1.2.

### General information on batten system with underfloor heating

Battens, joists and other wooden material included in substructures with underfloor heating systems should generally have a lower moisture content than normally specified because the wood will dry out more - in ideal conditions max. 10%. Veneer-laminated battens and joists supplied with a moisture content of 8-10% are therefore particularly suitable.

Insulation up to the underside of the heat-distribution plates and heating pipes will reduce the heat loss.

### Nailing to bearers across batten and joist framework

Boards or wide boards can be nailed to a self-supporting underlay of bearers mounted on battens/joists. Heat-distribution plates, in which heating pipes are installed, are fixed on to the bearers.

The load bearing strength of the bearers must be suitable for the use of the floor. The bearers are supported by battens/joists. For residential and office/light industrial interiors a distance of 600 mm is suitable, while for industrial, i.e. public buildings/shops battens/joist should be at maximum 500 mm.

The bearers must be planed on one side so that the thickness does not vary more than  $\pm 0.5$  mm, and must also have a residual thickness which leaves enough room for the heat-distribution plates. The thickness is usually minimum 23 mm.

Please note that in this example the floorboards lie parallel to the bearing battens/joists.

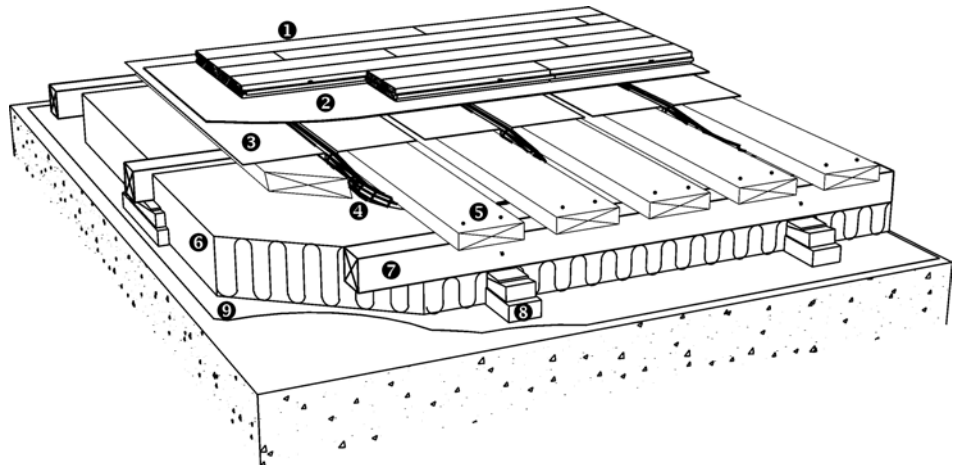


Fig. 3 - Floor heating on battens/joists (outline sketch)

**Components**

**1 - Boards/wide boards**

- 22 mm boards
- 22 mm ship's decking
- 20.5 mm wide boards
- 20.5 mm ship's decking

nailed to battens/joists with:

- 2.6 x 65 mm T-nails (machine nails)
- 2.8 x 65 mm lost head wire nails\* (hand nails)
- \*) pre-drilling with 2-2.5 mm drill

**2 - Intermediate layer**

- Floor cardboard, 500g/m<sup>2</sup>

**3 - Battens/joists**

- c/c distance: max. 600 mm

**4 - Heat-distribution plates**

**5 - Floor heating pipes**

**6 - Bearers**

- 25 x 100 mm
- c/c distance: 150 mm

**7 - Noggins**

**8 - Fittings for noggins**

**9 - Ceiling + insulation**

Fig. 4

**Nailing to batten and joist frames with underfloor heating**

Both 22 mm solid boards and 20.5 mm solid wide boards can be nailed to battens/joists which have an underfloor heating system built in between.

The underfloor heating system comprises heat-distribution plates with heating pipes laid on a wooden underlay of bearers boards, supported by noggins attached to battens/joists.

To avoid creaking, floor cardboard, 500 g/m<sup>2</sup>, is placed as an intermediate layer on the heat-distribution plates before the floorboards are installed.

To achieve the best possible temperature distribution the heat-distribution plates must be in close contact with the floor surface and the intermediate layer. This is done by mounting the upper side of the bearers level with the upper side of battens/joists.

The maximum 600 mm spacing of battens or joists makes this floor structure suitable for use in residential and office/light industrial interiors.

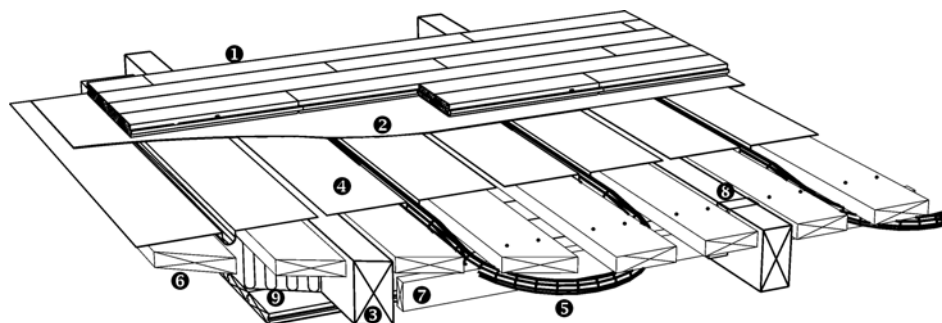


Fig. 5 - Floor heating built in between battens/joists (outline sketch)