

# JACKODUR<sup>®</sup> Inverted roof

Thermal insulation system - green roof design.



Installation Instructions



## General information

An expert designer or specialist company should always be consulted when designing and building an inverted green roof. JACKODUR® thermal insulation made from extruded polystyrene foam (XPS) is produced and monitored in accordance with DIN EN 13164 and approval no. Z-23.15-1477. Thanks to its closed-cell structure, JACKODUR® thermal insulation is resistant to moisture and is therefore ideal as insulation outside of the waterproofing layer.

## Substructure

The surfaces on which JACKODUR® thermal insulation is to be laid must be sufficiently level. There should be a gradient of at least 2%. A less steep gradient is possible but requires a higher quality of waterproofing (see “Flat roof guidelines”).

## Roof waterproofing layer

The waterproof layer must strictly be protected from root penetration or a root-proof waterproofing layer must be used. All conventional roof waterproofing can be used. It should be installed according to the manufacturer’s instructions. The roof waterproofing layer must satisfy the pertinent technical rules and standards, such as “Flat roof guidelines” and the DIN 18195 standard.

## Insulating layer

JACKODUR® thermal insulation may be laid on top of the roof waterproofing layer. The boards should be laid tightly against one another without cross joints and always in a single layer. JACKODUR® thermal insulation may be laid loose or spot bonded to the subsurface or bonded around the edges to the subsurface. The JACKODUR® thermal insulation must have edge profiling (e.g. shiplap).

The thermal conductivity of JACKODUR® thermal insulation according to general building regulation approval is to be taken into account in the calculation of proof of thermal insulation.

It must also be noted that in accordance with standard DIN 4108-2, an addition to the U-value must also be taken into account for inverted green roofs.

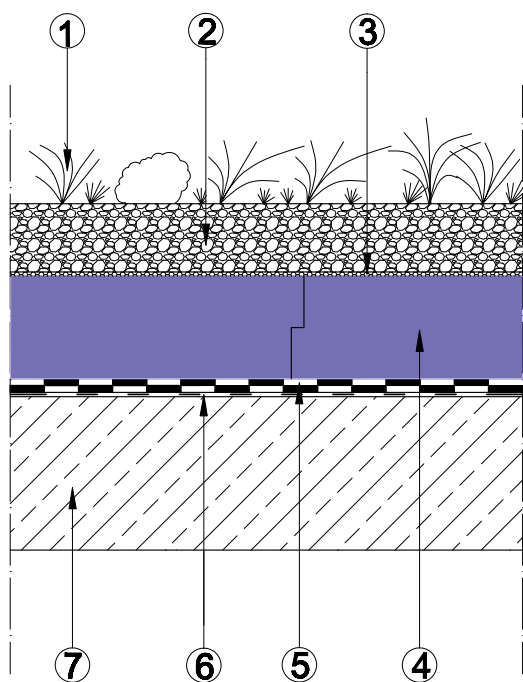
Table 1:  $\Delta U$ -value increase

Proportion of thermal resistance beneath the roof membrane as % of the total thermal resistance	Increase of the U-value $\Delta U$ W/(m <sup>2</sup> ·K)
0 – 10	0.05*
10.1 – 50	0.03
> 50	0

\* This value must always be used if the thermal resistance of the building component layers underneath the roof membrane < 0.1 W/(m<sup>2</sup>·K)

JACKODUR® thermal insulation should be exposed to direct sunlight for the shortest time possible. Otherwise it can lead to deformation of the JACKODUR® thermal insulation, especially in summer temperatures. For this reason, JACKODUR® thermal insulation, the filter layer and the protective layer should be laid step by step.

Figure 1: Extensive green roof



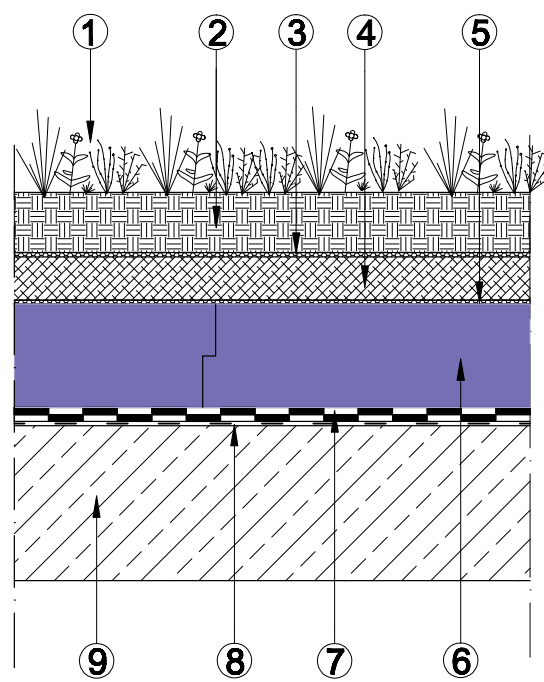
- ① Vegetation
- ② Vegetation layer
- ③ JACKODUR® filter layer
- ④ JACKODUR® Plus 300 Standard SF, JACKODUR® KF 300 Standard SF
- ⑤ Root-proof waterproofing
- ⑥ Primer
- ⑦ Load-bearing structure

Extensive green roofs use natural forms of vegetation, which are mostly self-maintaining and continue to develop.

### Protective layer/green roof

An expert designer or specialist company should always be consulted when designing and building an inverted green roof. When arranging a green roof above JACKODUR® thermal insulation, the pertinent technical rules such as the “Guidelines for planning, executing and maintaining green roofs” and the relevant administrative rules of the respective local building regulations must be followed. The following structure must strictly be provided (from top to bottom):

Figure 2: Intensive green roofs



- ① Vegetation
- ② Vegetation layer
- ③ Filter fleece
- ④ Drainage layer
- ⑤ JACKODUR® filter layer
- ⑥ JACKODUR® Plus 300 Standard SF, JACKODUR® KF 300 Standard SF
- ⑦ Root-proof waterproofing
- ⑧ Primer
- ⑨ Load-bearing structure

Intensive green roofs offer an almost limitless diversity of planting and design of open space planning, allowing any form of vegetation.

## Wind suction protection

Wind suction protection is to be measured in accordance with approval no. Z-23.34- 1540. The green roof superstructures can be taken into consideration as superimposed loads, but not the vegetation.

## Care and maintenance

Care and maintenance work must be carried out on inverted green roofs from time to time, in order to counteract potential changes, damage or consequential damage in good time. In the case of inverted green roofs, the aims of care and individual measures depend on the green roof method, the form of vegetation and the level of development in relation to the building.

## Penetrations and fixings

In order to prevent thermal bridges from occurring in penetrations in inverted roofs, the use of JACKODUR® perimeter adhesive foam is recommended to fill any imperfections.

JACKODUR® perimeter adhesive foam is also recommended for fixing JACKODUR® thermal insulation to the fascia. Instructions for using JACKODUR® perimeter adhesive foam can be taken from the relevant data sheet.



## Note

The information provided in this leaflet is based on our knowledge and experience to date. It does not constitute a guarantee in any legal sense. When using this product, please always bear in mind the circumstances of the particular intended application, especially with regard to physical, technical and legal construction issues.