JACKODUR® Inverted Roof

Thermal insulation system - vehicular access design.

Installation Instructions

JACKON by BEWI

General information

An expert designer or specialist company should always be consulted when designing and building an inverted roof with vehicular access. 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 the waterproofing layer. Motor vehicles with a permissible maximum weight of 2.5 t may drive on inverted roofs with vehicular access.

Substructure

The surfaces on which JACKODUR® thermal insulation is to be laid must be sufficiently level. In the case of inverted roofs with vehicular access, these surfaces must be prepared using layers of filler or levelling layers if necessary to ensure the functional capacity of the traffic bearing surface for its intended use. A gradient of ≥ 2.5% is generally required in the waterproofing layer and the layers above it. The exception to this is the inverted roof with vehicular access design described in A below, which uses prefabricated concrete slabs on elevated supports.

Roof waterproofing layer

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. Polystyrene induces plasticiser migration in plastic-based waterproofing. In order to prevent this, a separating layer (e.g. plastic non-woven material) should be arranged between the waterproofing layer and JACKODUR®.

Insulating layer

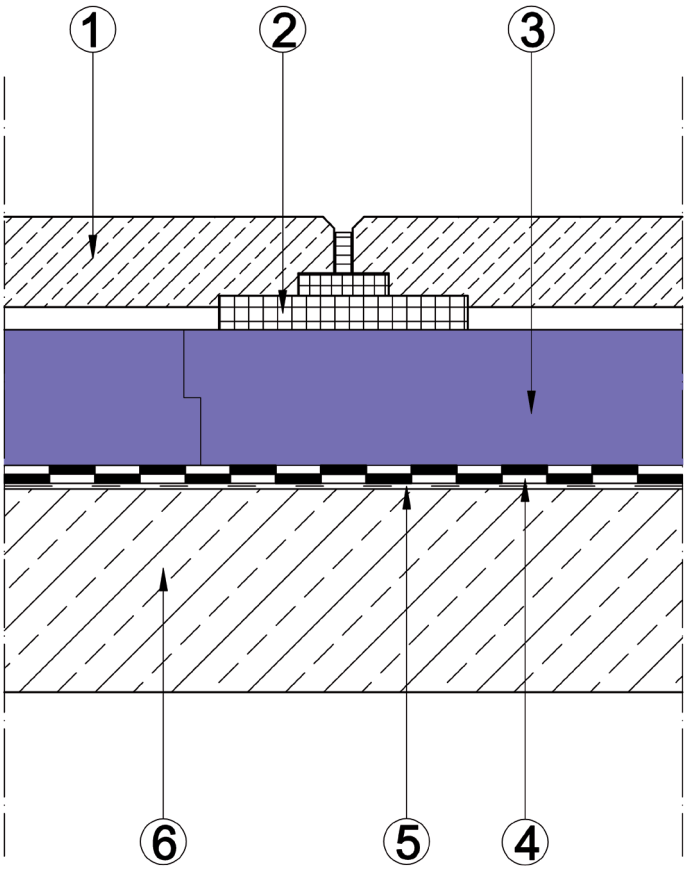
JACKODUR® thermal insulation may be laid on top of the roof waterproofing layer. The boards should be laid tightly against one another without cross joints and always in a single layer. JACKODUR® KF 500 Standard SF and JACKODUR® KF 700 Standard SF products are suitable for thermal insulation systems in inverted roofs with vehicular access, and should be selected depending on the traffic load.

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 should be laid step by step with a protective 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).

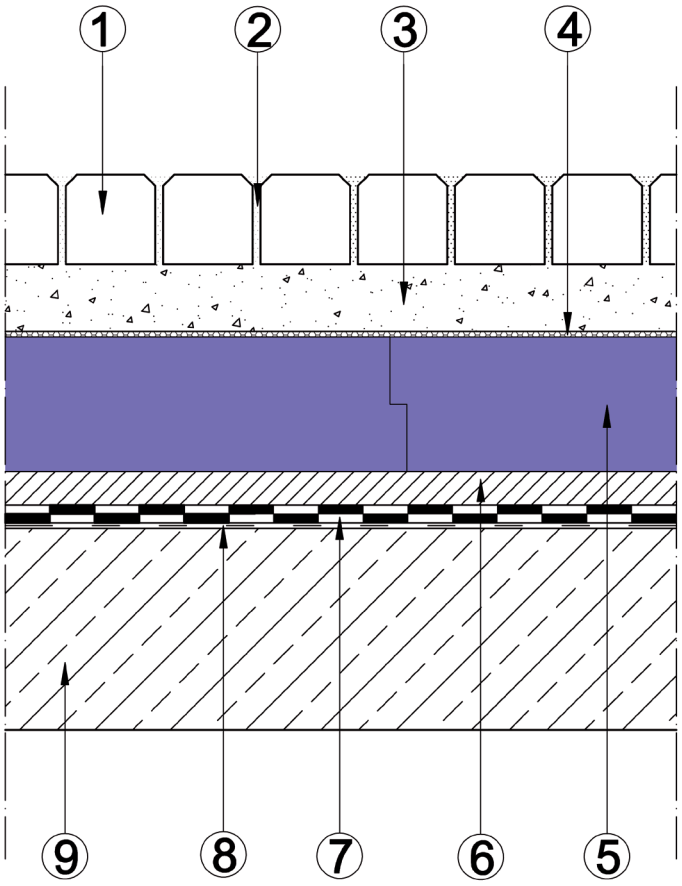
Inverted roof designed for vehicular access

Design A:
Inverted roof with vehicular access using prefabricated concrete slabs on elevated supports



① Prefabricated concrete slabs
② Elevated supports
③ JACKODUR® KF 500 Standard SF
JACKODUR® KF 700 Standard SF
④ Waterproofing layer
⑤ Primer
⑥ Load-bearing structure

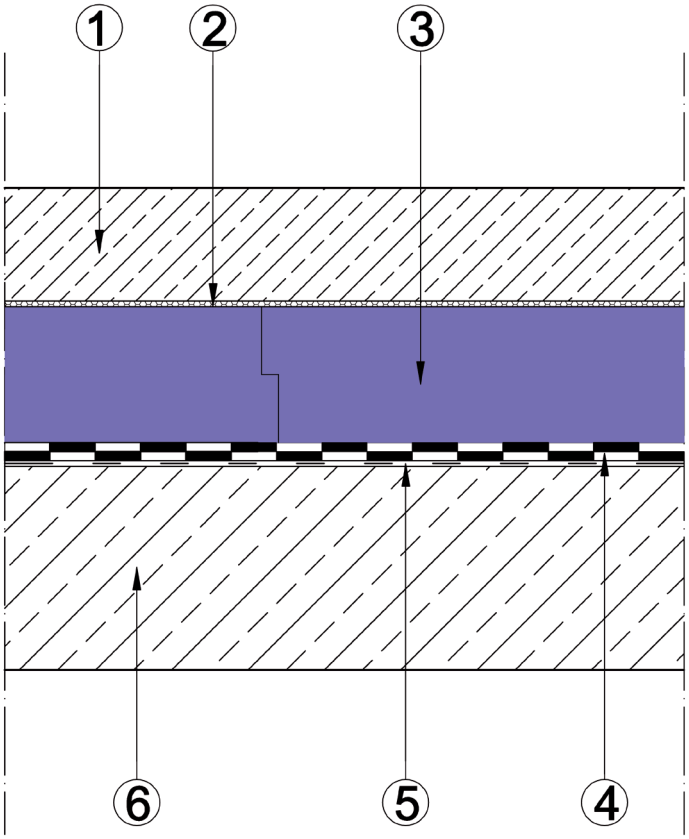
Design B:
Inverted roof with vehicular access using interlocking paving stones



① Interlocking paving stones d ≥ 100 mm
② Joint sand 0/2 mm
③ Bedding layer of frost-resistant gravel d = 50 mm, grade 2/5 mm
④ JACKODUR® WA filter layer
⑤ JACKODUR® KF 500 Standard SF or JACKODUR® KF 700 Standard SF
⑥ Mastic asphalt
⑦ Waterproofing layer (resistant to mastic asphalt)
⑧ Primer
⑨ Load-bearing structure

Among other things, DIN 18318 (Road construction, dry jointed sett and slab pavements and surrounds) sets out the requirements for laying paved surfaces, in particular compliance with joint width and the adjustment of joint sand to the bedding. Paved surfaces must be designed and executed carefully with respect to drainage. In Design B, a gradient of ≥ 2.5% is required for the waterproofing layer and the layers above it.

Design C:
Inverted roof with vehicular access using cast-in-place concrete slab



① Cast-in-place concrete
② JACKODUR® WA filter layer
③ JACKODUR® KF 500 Standard SF
or JACKODUR® KF 700 Standard SF
④ Waterproofing layer
⑤ Primer
⑥ Load-bearing structure

The joints between the cast-in-place concrete slabs must be protected from water penetration. In Design C, a gradient of ≥ 2.5% is required for the waterproofing layer and the layers above it.

Measuring the heat transfer coefficient U

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 roofs.

Table 1: ΔU supplements for inverted roofs

Proportion of thermal resistance beneath the roof membrane as % of the total thermal resistance	Increase of the U-value ΔU W/(m²·K)
0 – 10	0.05
10.1 – 50	0.03
> 50	0

Drainage

Taking measuring standards into account, the roof drainage must be arranged such that precipitation can be channelled off over short distances (see DIN EN 752, DIN EN 12056, DIN 1986-100).

Care and maintenance

Care and maintenance work must be carried out on parking surfaces from time to time, in order to counteract potential changes, damage or consequential damage in good time. The earlier damage or changes are detected, the lower the expenditure on maintenance work will be. Inspection must entail a professional and expert inspection of building component surfaces to establish their actual condition and in particular functional capacity. Inspection results must be documented in writing.

Wind suction protection

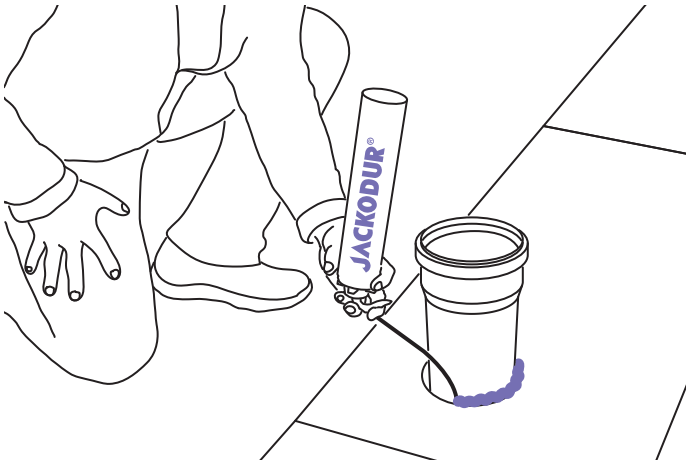
Wind suction protection is to be measured in accordance with approval no. Z-23.34-1540.

Flat roof filter layer

If a flat roof filter layer (e.g. JACKODUR® WA filter layer) is used, the penetration of small pieces of stone into the joints of the thermal insulation boards will be prevented and the thickness of the protective layer that needs to be applied can be reduced..

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.



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