



Low energy buildings - Case Study: Apartment building in Bad Mergentheim



Category / year

Renovation – Large residential (multi-family house) / 2009



Address

Herrenwiesenstrasse 42, Bad Mergentheim (Germany)



Contact details

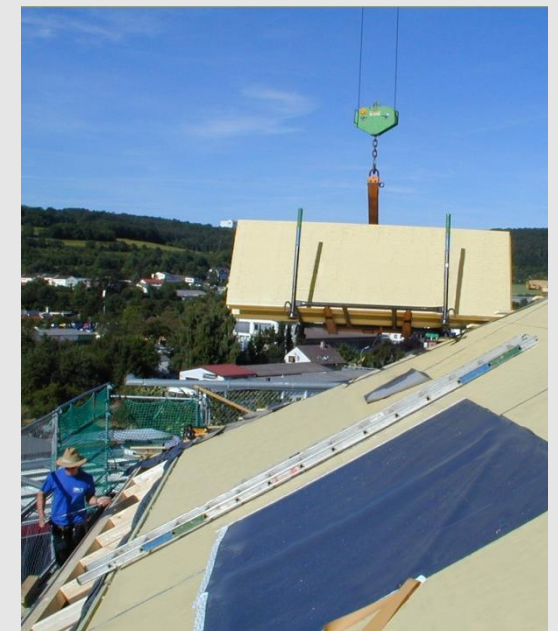
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Pictures





Description of the building

Detailed description:

A six-story apartment building in Bad Mergentheim, originally built in 1961, was renovated with a view to enhancing the appearance of the building and reducing energy consumption to 30 % below the level of a new building (to EnEV 2007).

By insulating and sealing the building envelope, installing new windows and modernizing the heating system, the primary energy demand of the building was dramatically reduced by over 70 %.

Building envelope:

- *Roof:* the building's hip roof was fitted with PUR/PIR insulation LINITHERM PAL N+F (140 mm, lambda 0.023) on the rafters to avoid thermal bridges. With a bulk density of 33 kg/m^3 , PUR/PIR adds only little weight to the roof structure and only slightly increases its thickness.
- *Roof windows:* the newly installed roof windows incorporated LITEC DDZ insulation frames. Because the frames made of recycled PUR/PIR rigid foam are supplied in standard lengths and cut on site to fit the window frame, they can easily be adapted to different window shapes and sizes.
- *Facade:* the facade was insulated with PUR/PIR boards (80 mm, lambda 0.027). The decision to use a high performance insulant was particularly important for the balcony recesses, as their surface was already small before renovation. Thanks to its low thermal conductivity, the surface was only marginally reduced.

Energy efficient technologies:

- *Heating system:* gas burner and mini block heating station

Renewables:

- None



Energy consumption

Energy values:

- *External wall (U-value):*

Before renovation	After renovation
1.13 W/(m ² ·K)	0.19 W/(m ² ·K)
- *Roof (U-value):*

Before renovation	After renovation
2.63 W/(m ² ·K)	0.16 W/(m ² ·K)
- *Windows (U-value):*
After renovation: 1.00 W/(m²·K)
- *Total primary energy demand:*

Before renovation	After renovation
201 kWh/(m ² ·a)	53.60 kWh/(m ² ·a)

Use of renewables:

- None

