

Topic 10 ROOFING

Part 4: Thermal insulation of roofs

The total heat losses of buildings through the roof are about 20-25%. Depending on the type of roof, the percentages of heat loss could increase or decrease. If ventilated spaces are left when designing a roof, then the roof is called cold roof. The roofs are divided into warm and cold roofs. Sloping roofs require more thermal insulation than flat roofs due to the larger surface area. Sometimes it is preferable to put thermal insulation on the flooring above the ceiling instead of on the slope. This is done with an unheated roof cavity. In addition to the insulation of the ceiling, thermal insulation can be applied between the rafters of the roof structure.

Approximately 5 cm of space is left between the top of the rafters and the thermal insulation, and this space provides ventilation. The interior or bottom of the rafters can be insulated or the top of rafters can be isolated also. If necessary, the waterproofing and thermal insulation materials on which the tiles will be placed are made here on the rafters. There may be evaporation due to condensation.

The insulation materials used in roofing are:

Glass wool – thermal conductivity coefficient 0.035-0.050 W/m.K. The maximum temperature at which it can be used is 250 degrees, it is resistant to burning. It is a Class – A fireproof insulation material. Glass wool is used for thermal and sound insulation. It is UV resistant.

Stone wool – thermal conductivity coefficient 0.035-0.050 W / m.K. The maximum temperature at which it can be used is 750 degrees. It is a Class – A fireproof insulation material. Stone wool is resistant to UV rays. It can be used for heat and sound insulation.



Figure 1. Glass wool

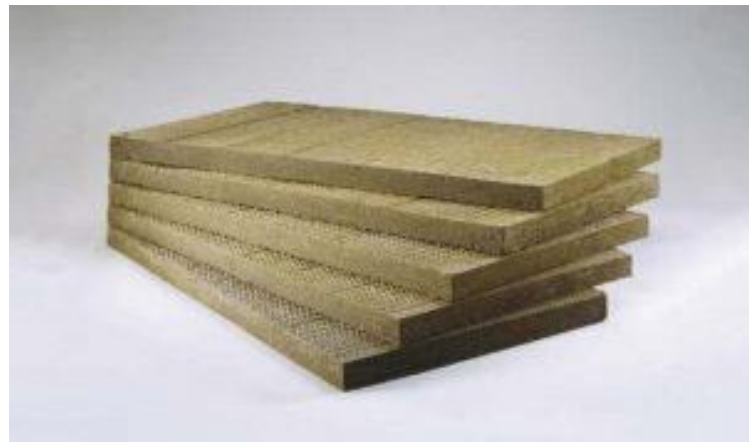


Figure 2. Stone wool

Extruded polystyrene (XPS) – thermal conductivity coefficient 0.030-0.040 W/m.K. The maximum temperature at which it can be used is 75 degrees. It is a Class – B1 fireproof insulation material. This material is not resistant to UV rays. It is mainly used for thermal insulation of roofs.

Expanded polystyrene (EPS) – thermal conductivity coefficient 0.035-0.040 W/m.K. The maximum temperature at which it can be used is 75 degrees. It is a Class – B1 and B2 fireproof insulation material. This material is rarely used in roof insulation.

Polyurethane – thermal conductivity coefficient 0.020-0.040 W/m.K. The maximum temperature at which it can be used is 110 degrees. It is a Class – B1 and B2 fireproof insulation material. This material can be used for roofs.