

Section 1.7

Introduction

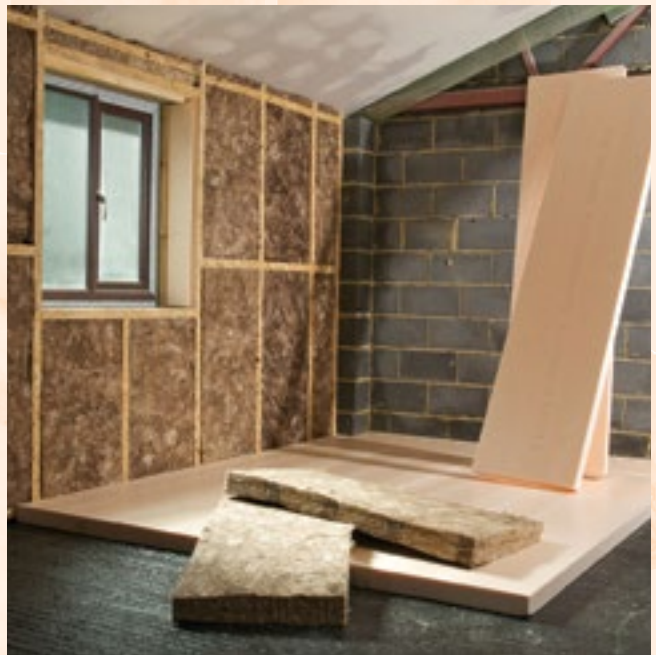
Types of Insulation



Types of insulation

There is a very broad spectrum of insulation materials available on the market, with an equally broad variance in form, performance, sustainability, cost-effectiveness and availability.

Knauf Insulation manufactures four different types of insulation: glass and rock mineral wool; extruded polystyrene and extruded polyethylene and therefore can offer advice on the most appropriate type of insulation for a specific application.



Glass mineral wool

Glass mineral wool is made from sand and recycled glass, limestone and soda ash. These are the same ingredients that are used to make familiar glass objects such as window panes or glass bottles. The glass is spun to form millions of fine strands of wool. A resin is used to bind the wool together to form a mat of material. The density of the product determines whether the insulation is a lightweight quilt supplied in rolls, a flexible slab or a rigid slab, and its thermal insulation value.

Characteristics

- Long strands, giving good tear strength
- Suitable for temperatures up to 230°C
- Non-combustible
- Lightweight
- Available in rolls and slabs
- Low to very low environmental impact
- Ability to be compression packed
- Good acoustic absorber

Main uses

- Loft insulation
- Cavity wall insulation (built in and injected)
- Sound insulation (absorption) within partitions and floors



The core range of mineral wool rolls and slabs available from Knauf Insulation are made using ECOSE® Technology - a revolutionary, new, formaldehyde free binder technology, based on rapidly renewable materials instead of petro-based chemicals. It reduces embodied energy and delivers superior environmental sustainability. ECOSE Technology was developed for glass and rock mineral wool insulation, but offers the same potential benefits to other products where resin-substitution would be an advantage, such as in wood based panels, abrasives and friction materials.



Glass mineral wool rolls



Glass mineral wool slabs



Glass mineral wool - blown

Rock mineral wool

Rock mineral wool is made mainly from volcanic rock, typically basalt and/or dolomite. An increasing proportion is now recycled material from slag, a waste product from blast furnaces. The materials are melted and then spun into fine strands of wool. A resin is used to bind the wool together to form a mat of insulation.

Characteristics

- Short strands – high compressive strength
- Suitable for temperatures up to 850°C
- Non-combustible
- Denser than glass mineral wool
- Available in slabs, rolls and mattresses
- High compressive strength

Main uses

- Thermal insulation of flat roofs, rainscreen façades and external wall insulation
- Fire protection of structural steel, including smoke and fire barriers
- High temperature applications
- Sound insulation for floors and walls



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Rock mineral wool mattress



Rock mineral wool slabs

Foamed plastics

- Extruded polystyrene (XPS)
- Extruded polyethylene (XPE)

Extruded polystyrene (XPS)

Extruded polystyrene (XPS) is made by mixing polystyrene pellets with various ingredients to liquify them. A blowing agent is then injected into the mixture, to form gas bubbles. The foaming liquid is then forced through a shaping die. When cooled, it produces a closed cell foam that is rigid and moisture resistant.

Characteristics

- Lightweight
- CFC and HCFC free
- High compressive strength
- Zero ODP and GWP <5
- 100% recyclable
- Excellent water resistance
- Suitable for temperatures up to 70°C
- Excellent freeze thaw performance
- Available in large board sizes
- Easy to cut shape and form

Main uses

- Ground floors
- Flat roofs
- Heavy duty floor insulation
- Panels and other fabrication applications

Polyfoam ECO has a Global Warming Potential (GWP) of less than five.

Extruded polyethylene (XPE)

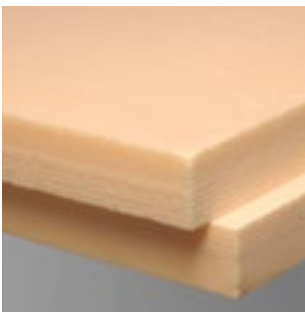
Extruded polyethylene (XPE) is made by mixing polyethylene pellets and other ingredients, a blowing agent is injected in liquid form causing a foaming reaction. A conical shaping die is used to shape and form the XPE, producing a material that quickly cools into a flexible, closed cell plastic foam.

Characteristics

- Lightweight
- CFC and HCFC free
- Excellent acoustic performance (impact sound)
- Excellent moisture resistance
- Good compression resistance
- Typically sold in roll form
- Available in cut component rolls

Main uses

- Resilient layer in acoustic floors
- Flexible edge strip in screeded floors
- Packaging



Extruded polystyrene (XPS)



Extruded polystyrene (XPS)



Extruded polyethylene (XPE)



Extruded polyethylene (XPE)

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it's time to save energy