# Global comparison

## Types of insulation

| | | | Use | | | | | Insulating characteristics | | | | | | Technical characteristics | | | | | | Environmental assessment | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Origine | Insulation | Conditioning | Wall | Floor/roof lost | Roof slope | Outside roof insulation | Concrete slab | R factor per inch | R for 3 1/2" thickness | R for 5 1/2" thickness | R for 7 1/2" thickness | Density kg/m³ | Hygroscopic capacity | Water vapor resistance (m) | Fire classification | Phase shift time for 7 1/2" | Summer comfort | Winter comfort | Heating/air conditioning speed | Gray energy | CO2 storage |
| Synthetic insulation | Expanded polystyrene | Flexible panels | • | • | • | • | • | 4 | 14 | 22 | 30 | 10 | No | 50 | B | 6 | ☹ | ☹ | ☹ | ☹ | ☹ |
| | Spary foam | Blown bulk | * | * | * | * | * | 6 | 21 | 33 | 45 | 16 | No | 50 | B | 6 | ☹ | ☹ | ☹ | ☹ | ☹ |
| Mineral wool | Fiber glass | Flexible panels | • | • | • | • | • | 3,6 | 13 | 20 | 27 | 15 | No | 1 | A to B | 6 | 😐 | 😐 | ☺ | 😐 | ☹ |
| | Rockwool HD | Flexible panels | • | • | • | • | • | 3,7 | 13 | 20 | 28 | 32 | No | 1 | A to B | 6 | 😐 | 😐 | ☺ | ☹ | ☹ |
| Plant-based insulation | Wood fiber | Dense panels | • | • | • | • | • | 3,8 | 13 | 21 | 29 | 50 | Low | 4 | E | 15 | ☺☺ | ☺☺ | ☺☺ | 😐 | ☺☺ |
| | Paper cellulose | Blown bulk | • | • | • | | | 3,7 | 13 | 20 | 28 | 56 | Ave. | 1 | B to E | 10 | ☺ | ☺ | ☺ | ☺ | ☺ |
| | | Bulk dumped | | • | | | | 3,25 | 11 | 18 | 24 | 26 | Ave. | 1 | B to E | 10 | ☺ | ☺ | ☺ | ☺ | ☺ |
| | Hemp wool | Flexible panels | • | • | • | • | | 3,7 | 13 | 20 | 28 | 35 | Ave. | 1 | E | 7 | ☺☺ | ☺☺ | ☺☺ | ☺☺ | ☺☺ |

• Recommended use

☺☺ Very good
☺ Good
😐 Average
☹ Bad

**Hygroscopicity:** Characterized by the material's ability to store moisture when in contact with moist air. The management of humidity is managed by the phenomemnon of capillarity which allows humidity to travel from the wettest place to the driest place. Only plant-bases insulations can do this.

**Thermal phase shift:** Corresponds to the time it wil take for heat to penetrate inside a building. The phase shift can be very short, such as extending over several hours. For example, in a building with heavy materials and dense intulation, we appreciate in summer long thermal phase shifts around 7 to 12 hours. We can thus benefit from the heat of the solar radiation in the vening and the freshness of the cold stored at night during the day. No need for additionnal air conditionning, everything works like a natural heating regulation system.

NATUREfibres
FABRICANT D'ISOLANT DE CHANVRE

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