



# REGUPOL ACOUSTICS

## FOR TIMBER CONSTRUCTION

We offer a wide portfolio of effective sound insulation solutions for timber construction.



# OPTIMISING SOLUTIONS FOR SOUND INSULATION IN TIMBER CONSTRUCTION

Sustainable construction is getting more popular worldwide and wood with its enormous ecological benefits presents an excellent alternative to mineral building materials. However, acoustically the naturally derived resource might be left standing, especially when it comes to low frequencies. Even if building regulations or increased sound requirements are met, users may be dissatisfied.

For this reason, wood construction research also focuses on the low frequencies <100 Hz for the quality of sound insulation and extends the range of consideration by the spectrum matching value  $C_{1,50-2500}$ . This way, no blind spot remains and the perception of the occupants is taken into account.

Sometimes these circumstances can lead to highly challenging acoustic engineering tasks. To understand the correct acoustic design rules, it helps to subdivide them into wooden beam and solid wood construction.

## Certified Quality



MADE IN  
GERMANY





# WOODEN BEAM CEILINGS

**REGUPOL** offers three solutions for the acoustical optimisation of wooden beam ceilings, which have a significant influence on the quality of the sound insulation, especially in their combination.

## (1) Optimisation by impact sound insulation

For impact sound insulation under screed, a low dynamic stiffness  $s'$  is important. Low construction height and low compressibility  $c$  are also preferred in many contexts.

### **Recommended product for impact sound insulation: REGUPOL comfort**

The **REGUPOL comfort** range is CE certified and has been tested in accordance with DIN EN ISO standards, offers clear advantages in thicknesses of 5, 8 and 12 mm:

Outstanding acoustic performance despite a low installation height and a low dynamic stiffness value  $s' \leq 10 \text{ MN/m}^3$  (12 mm). In addition, the product consists of PUR-bonded recycled elastomers and saves resources while supporting sustainability goals.

## (2) Optimisation by fill

Depending on the acoustic requirements, wooden beam ceilings need a heavy filling. In addition, this should be bonded so that there is no material migration during the use phase. An elastic bond should be preferred over a rigid cementitious bond so that a higher internal damping of the system can be realised.

### **Recommended product for filling: REGUPOL comfort S1**

**REGUPOL comfort S1** is an elastically bonded, pressure-resistant levelling fill which hardens within a very short time to form an elastic, mass-increasing and water-free layer. **REGUPOL comfort S1** is suitable according to DIN 18560-2 for levelling out unevenness on load-bearing concrete, wooden beam or solid wood ceilings. Due to the above properties, **REGUPOL comfort S1** contributes significantly to the acoustic improvement of the ceiling, so that excellent results can be achieved even at low installation heights.

Other important advantages are the water-free installation and the fast curing. The fill can be walked on after only six hours and is fully loadable after 24 hours. The emission behaviour complies with the specifications of the Committee for Health-related Evaluation of Building Products (AgBB). Recyclability requirements are also met. An installed **REGUPOL comfort S1** levelling fill achieves the highest quality class of substitute building material (RC1).

### (3) Optimisation by elastic suspension system

When optimising suspended ceilings, it is advisable to use the heaviest, most flexible ceiling cladding possible. Another important optimisation criterion is the elastic suspension of the ceiling. Significant improvements compared to more rigid connections (spring rail) are in the low-frequency range.

#### Recommended product as suspension system: REGUFOAM hangers

The five types of the **REGUFOAM hangers** range cover a load range of 5.5 - 42 kg per hanger. Depending on the design of the suspended ceiling, the types can be specifically tuned to natural frequencies of 12 - 25 Hz. This way, economical beam ceilings and increased sound insulation can be achieved at the same time.

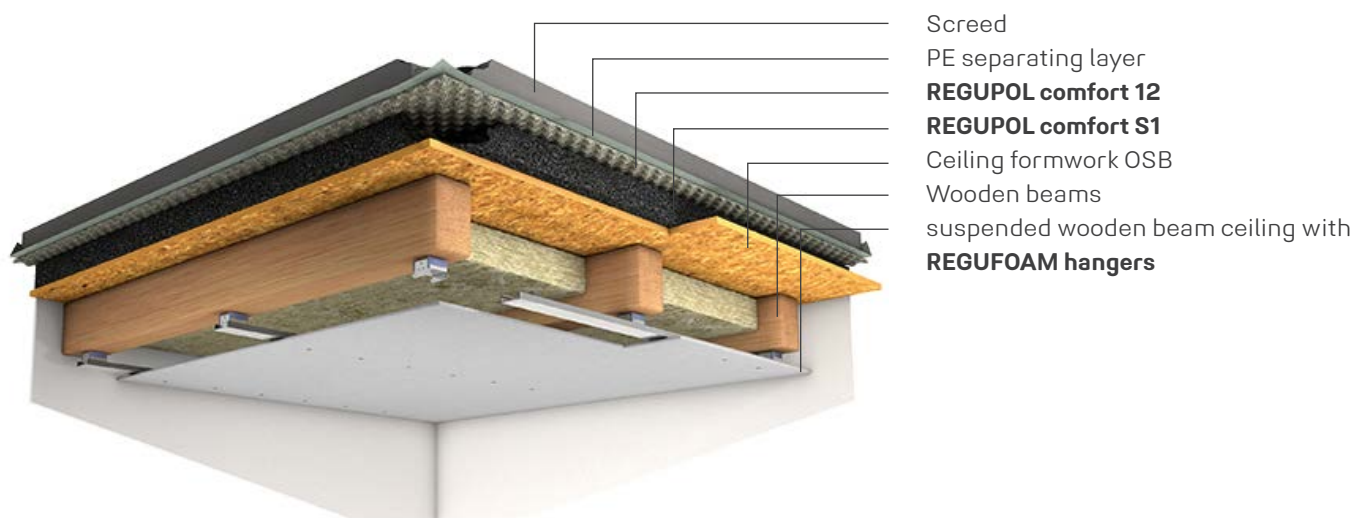
A series of tests for the practical handbook on sound insulation in timber construction has highlighted its special performance. Thus, the **REGUFOAM hanger QH.F 220plus** could achieve the following test result in a very economical ceiling construction:

$$L_{n,w} + C_{l, 50-2500} = 37 (+12) \text{ dB}$$

### Result of the system design

When using the **REGUFOAM hangers QH.F 270plus** in combination with the elastically bonded fill **REGUPOL comfort S1** in 30 mm and the impact sound insulation **REGUPOL comfort 12**, both the increased sound insulation and the comfort sound insulation level could be reliably achieved:

$$L_{n,w} + C_{l, 50-2500} = 29 (+11) \text{ dB}$$



# SOLID WOOD COMPONENTS

The acoustical optimisation of solid wood ceilings is also achieved by combining **(1) impact sound insulation** with elastic, mass-increasing **(2) fill**. In addition to the above optimisation measures, **(4) flanking element decoupling** is also used in practice.

## (4) Optimisation by flanking element decoupling

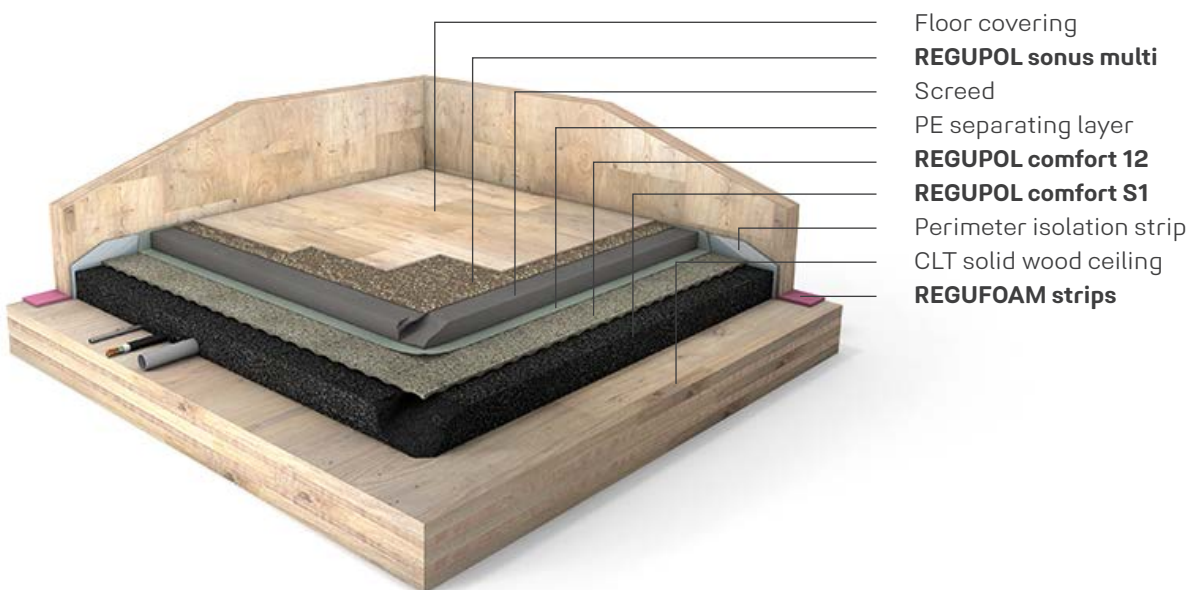
Solid wood and CLT ceilings with particularly high acoustic performance can only be realised with great effort, thus having a direct impact on the cost and overall height of the ceiling system. To ensure that the previous efforts are not counteracted, care should be taken with the flanking sound transmission by solid wood components.

### Recommended product for flanking element decoupling: REGUFOAM strips

For additional optimisation, **REGUFOAM strips** as wall or ceiling bearings offer an excellent solution for an effective reduction of flanking noise transmission.

**REGUFOAM** is approved by the building authorities and has been offering defined properties as a structural bearing for decades. **REGUFOAM strips** - especially in modular construction - are used for an effective improvement of the joint insulation  $K_{ij}$  on all critical sound paths.

As an elastic intermediate layer, it needs on the one hand a low deflection under load and on the other hand a low natural frequency within the mass-spring-system. The calculable properties and the range of different product types or material densities allow individual design recommendations for your project.





# REGUPOL PRODUCTS

## FOR TIMBER CONSTRUCTION



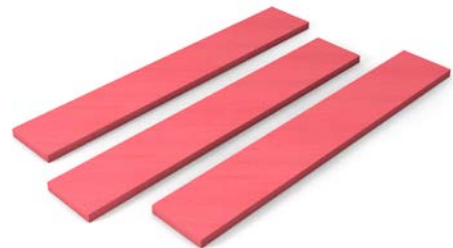
**REGUPOL comfort**  
Impact sound insulation with low installation height



**REGUPOL comfort S1**  
Elastically bound levelling fill



**REGUFOAM hangers**  
for elastic suspended ceilings of wooden beams



**REGUFOAM strips**  
for flanking element decoupling as wall and ceiling bearing



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