

# Bio-based materials in healthcare

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## What are bio-based raw materials?

Bio-based raw materials are substances derived from renewable, nature-based materials.

## What are wood-based materials used for in healthcare applications?

Wood-based materials are already used in healthcare, from mechanical wood applications to tree fibres, nanocellulose and natural polymers.

Solutions using mechanical wood are used to provide a positive healing environment in hospitals as trees have been fighting against pathogens for hundreds of millions of years longer than humans. Their well-honed strategies are also used in ointments made from resin, which can even defeat bacteria resistant to antibiotics.

Products based on tree fibres, such as paper and cardboard, are used to replace synthetic materials in plasters. While they absorb water, they remain breathable, helping wounds to heal safely.

Nanocellulose can form semi-solid hydrogels capable of efficiently absorbing moisture while also enabling airflow. They serve as treatment for burn patients and as cell storage surfaces, maintaining moisture for prolonged cell survival and growth. Additionally, they foster the growth of biomolecules that cannot survive on synthetic surfaces.

Because they shed bacteria, natural polymers have long been used to create various surgical protective membranes.

## Bio-based raw materials' best features

- **Moisture absorbency**  
Cellulose-based substances can absorb copious amounts of water.
- **Breathability**  
The materials maintain their breathability even when wet.
- **Biologically inert**  
The materials do not cause a defence reaction in the human body.
- **Anti-biofouling**  
Cellulose-based substances do not easily collect unwanted proteins or other contaminants.

## How to find the right bio-based raw material

The sheer abundance of bio-based materials available means expert advice is needed to find the suitable materials for your needs. VTT can guide you in finding and developing the right bio-based raw material, helping you scale development from the laboratory to factory-level production.

