

Textile Reinforced Concrete (TRC) Core for Sports Equipment

The ski core has always been the centrepiece of every ski, defining its distinctive characteristics. To this day, the core is almost exclusively made of wood.

TU Wien proposes a novel ski core made of textile-reinforced concrete (TRC). Using TRC in the production of sports equipment opens up new dimensions of performance in terms of load-bearing capacity and dynamics, while simultaneously allowing for individual customisation of the skiing characteristics.

BACKGROUND

The prestressing is one of the most important aspects that influences the performance of skis and sports equipment of similar construction (e.g. snowboards, water skis, wakeboards).

With a core made of textile-reinforced concrete (TRC), the desired prestressing load can be easily varied during production and the ski can thus be designed to the specific characteristics desired (hardness, radius, damping,...), e.g. as a soft free-ride ski, stiff alpine ski or individually adjusted (racing ski, custom made ski).

Ski with textile-reinforced concrete core

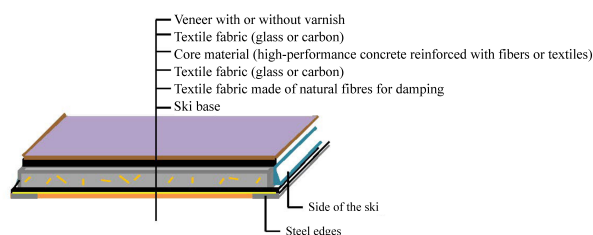


Fig.1: Novel construction layout

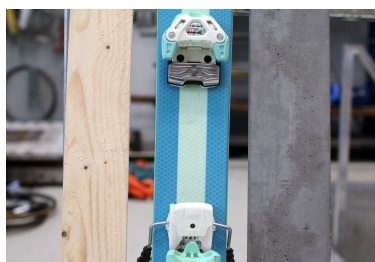


Fig.2: Testing bodies for comparison of oscillation behaviour

TECHNOLOGY

Textile-reinforced concretes show very high load-bearing capacities compared to wood, as well as higher torsional and bending stiffness at adequate damping behaviour. This opens up new applications in the sports equipment sector.

As reinforcements for the concrete, synthetic fibres, glass fibres, basalt fibres and also natural fibres, for example bamboo, preferably preprocessed as a textile, can be used.

In the concrete mix design, particular attention is paid to substituting cement with alternative binders to the greatest possible extent in order to reduce CO₂ emissions to a minimum.

ADVANTAGES

The main advantages of the invention are as follows:

- Simple variation and application of the initial prestressing level
- Simple manufacturing process of the textile-reinforced concrete core
- Good damping behaviour and (expected) increased stability of the ski
- Use of locally sourced raw materials for production
- Good recyclability of the materials used

REFERENCE

M030/2021

DEVELOPMENT STATUS

Proof of Concept

APPLICATIONS

Sports equipment with a core and initial prestressing

KEYWORDS

Ski-core, textile-reinforced concrete, TRC, damping, prestressing, torsional stiffness, bending stiffness

IPR

Austrian patent granted
International patents pending

OPTIONS

R&D – cooperation
License agreement

INVENTORS

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