THE SLING – IMPROVED ANCHORAGE FOR CFRP TENSION MEMBERS

HINTERGRUND

Carbon fibers display a high tensile strength and a high stiffness while simultaneously having a low mass. Due to their high strength in fiber direction, carbon fiber reinforced plastics are especially suitable for bar-shaped tension members.

It was thus the objective of the present invention to provide an improved tension member made of carbon fiber-reinforced plastic (CFRP) by changing the manufacturing method and increasing the bearing capacity of the loop to up to 100%.

PROBLEMSTELLUNG

A special challenge hereby is the anchoring of the carbon fibers that would be suitable for the material. Through the anchorage, the fibers at the anchoring point are often weakened or exposed to additional strain, so that a corresponding cross-section of the fibers experiences early failure prior to reaching its actual bearing capacity.

LÖSUNG

For this purpose, the invention discloses a multi-layer anchoring with at least one loop formed by double-sided carbon fibers. It serves to attach bendable CFRP tension members.

To form the anchoring, the carbon fibers are alternately placed around the deflecting body and are embedded between the incoming fiber strands. In this way, the fibers overlap each other so that the total cross section at the level of the deflection is greater than that of the incoming fibers. The frictional connection of the fibers is achieved by the solidification of the plastic (for example by increasing the temperature, chemical reaction of the coating, injection of the plastic, application of lateral pressure) in the entire or only in
some areas of the overlap.

VORTEILE

- Tension member can be formed in any desired length and bearing load
- Failure of the element at the anchorage point with applied traction force can be avoided
- Pultruded bar-shaped profiles with any desired cross-section can be used for forming the tension element

ANWENDUNGSBEREICHE

As the sling is formed only locally at the end of the fibers it can be used in various applications with respectively different dimensions possible, like for example as an individually designed component, or as part of a support structure for building structures such as buildings, bridges, tunnels, sports facilities, towers, tents, or also for mobile machines such as cranes, ships, wind turbines.

SERVICE

Possible cooperation:

- R&D Cooperation
- Patent Sale
- Licensing