



# ELiSE

Evolutionary Light Structure Engineering

Medical engineering

## Orthopedic cast

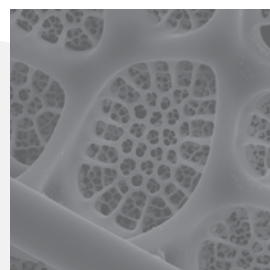
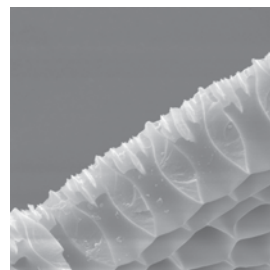
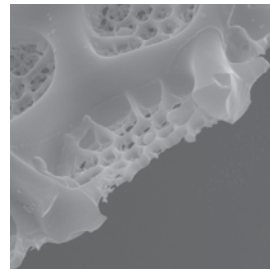
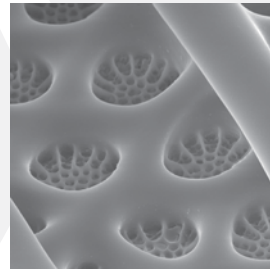
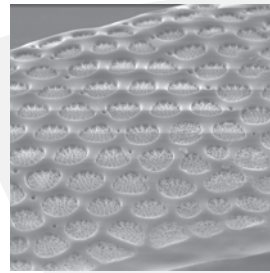
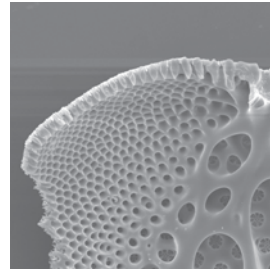
In medical engineering low weight, high stability and air permeability are highly important for orthopedic casts treating bone fractures and other injuries as well as for orthoses, which need to be worn long-term. They require a low weight, high stability and air permeability. Our honeycombed fractal (self-similar) structures are based on the exoskeletons of marine diatoms, which have been developed through evolution and competition over millions of years. The use of these bionic fractal structures has several advantages especially in orthopedics and medical technology of splints and casts.

Economically profitable thermoplastic and duroplastic materials such as PVA (Polyvinyl alcohol), PVC (Polyvinylchloride) or alternatively other high-tech materials with arbitrary coloration can be used for the production of these casts. An additional support through fiberglass or carbon fibers allows the casts' adaptation to specific stress conditions. A combination of our casts, compression dressings and bolstering can be used to increase the patients' comfort and enhance the healing process. Hooks, clips or hook-and-loop fasteners ensure the casts' optimal fixation.

The use of thermoplastic materials allows an individual, practical, repeatable adjustment of the cast to different extremities. A flexible design of the single combs is possible – however; the size should not exceed 30mm in diameter to avoid the formation of edema. The innovative design with open combs allows access to the patients' skin without the need to open the cast and furthermore ensures a high aeration of the wounded area.

- > High mechanic stability
- > Full immobilization of extremities
- > Combination with bolstering, flexible bandages and interlocking systems is possible
- > High air permeability and comfort

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WEIGHT REDUCTION

50%

LEARNING FROM NATURE

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