Fraunhofer IFAM

Water-soluble cores

The key technology for complex hollow components

High pressure die-cast inverter housing with integrated cooling - manufactured using a cast salt core.

Cast salt cores are an enabler to create highly complex, integrated cavities – not only in die-cast parts, but also in plastic and carbon fiber reinforced components (CFRP). Fraunhofer IFAM provides development, small-batch production, and qualified material data from a single source.

Customer benefits at a glance

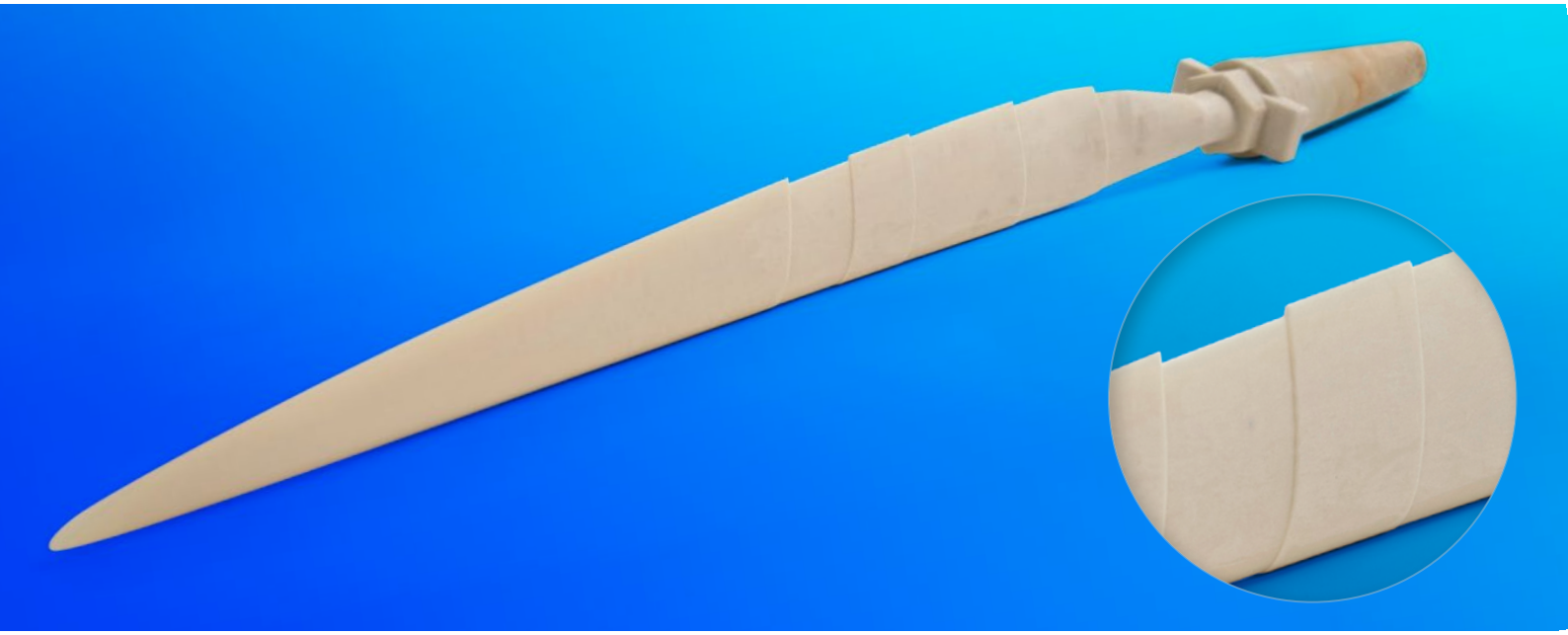
- Maximum design freedom: complex shapes, internal channels, and cavities
- High-end surface quality: smooth, dense surfaces with high imaging accuracy
- Dimensional accuracy and stability: high mechanical and thermal strength of the cores
- Process reliability: laminar mold filling, high reproducibility
- Easy core removal: reliable, residue-free removal
- Cost-effectiveness: reduced investment compared to alternative core manufacturing processes

Properties of cast salt cores

- High imaging accuracy and dimensional stability
- Very good, smooth, and dense surfaces
- High mechanical and thermal stability
- Easy, residue-free removal from the component

Process advantages of the technology developed at Fraunhofer IFAM for salt core production in low-pressure die casting

- Laminar casting and high process stability for consistent core quality
- Significantly lower investment requirements (compared to complex die casting peripherals for core production)
- Encapsulated furnace chamber: no corrosion problems



Expanded applications

The water-soluble salt cores are not only suitable for die-cast parts, but also for the production of hollow plastic parts and carbon fiber reinforced components (CFRP). They are ideal for processes such as RTM, HP-RTM, and infusion processes.

Services offered by Fraunhofer IFAM

- Technology transfer for successful introduction and application in industry
- Development of molds and casting processes for cast salt cores
- Production of small and pre-series in low-pressure casting or gravity casting
- Customized salt mixtures with improved casting properties
- Establishment of the supply chain, including shelf life and storage conditions
- Characterization of salt mixtures (e.g., casting properties) and salt cores (e.g., microstructure, strength)
- Collection of thermophysical data and provision of data sets for casting simulation

Fields of application

- Hollow plastic and CFRP components for lightweight construction applications
- Cooling channels and media guides in die-cast parts
- Lightweight structural design with internal cavities
- Function integration in complex geometries

Why Fraunhofer IFAM?

- Scientific excellence, industry-oriented implementation
- Scalable solutions from development to pre-series production
- In-depth material and process expertise

Cast salt core for production of hollow CFRP propeller blades in high-pressure infiltration processes.

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