



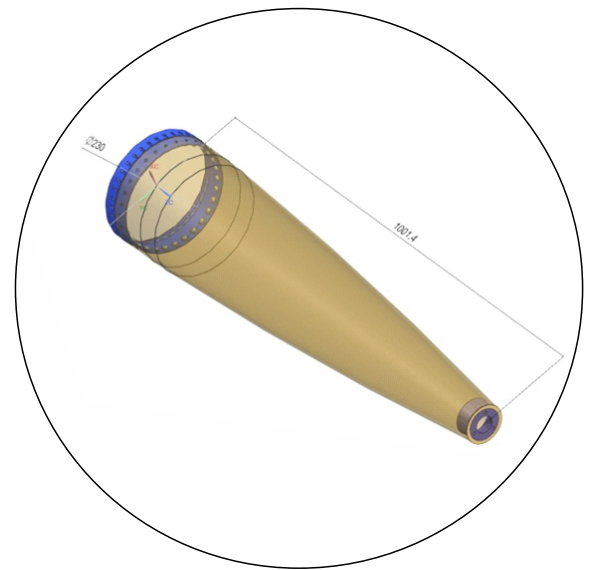
Łukasiewicz
Institute
of Aviation



**COMPOSITE
ROCKET
NOSECONE**

CHARACTERISTICS

- **Reduced weight:** Constructed from fiberglass and epoxy composite, the nose cone boasts a significantly lighter weight compared to traditional metal counterparts.
- **Enhanced structural integrity:** Utilizing advanced manufacturing technologies, the nose cone achieves superior structural integrity, resulting in increased durability and resistance to dynamic loads.
- **Enhanced performance:** The innovative design allows for improved missile system performance across various applications by enhancing flight efficiency and accuracy.



Developed by Łukasiewicz Research Network

– Institute of Aviation, this cutting-edge solution offers high strength, thermal resistance, and precision manufacturing, making it an ideal choice for both military and civilian applications where reliability and efficiency are paramount.

KEY FEATURES

- **Materials:** Crafted from glass fiber and epoxy resin (GRP), vacuum-bagged, and cured in an industrial oven to ensure exceptional quality and durability.
- **Filament Winding Technology:** The nose cone is produced using automated glass filament winding technology, ensuring precise construction and repeatability.
- **Thermal Resistance:** The product exhibits thermal resistance of up to 210°C, with the ability to withstand short-term protection against temperatures exceeding 500°C thanks to a specialized ablative layer.
- **Precision Machining:** The nose cone's geometry undergoes precision machining on CNC machines and is verified through 3D scanning, ensuring dimensional accuracy.
- **Quality Assurance:** Each nose cone undergoes meticulous metrological testing to guarantee compliance with technical specifications.
- **Leak Test:** The nose cone's airtight was verified in two stages, by use of nitrogen and helium (about 10^{-7} mbarL/s).
- **Strength Test:** The head qualified for flight under the conditions of sinusoidal and random vibration loads. The level of loading complies with NASA standards for sounding rockets.



The Łukasiewicz Research Network - Institute of Aviation

offers a wide range of specialized research, engineering services and products. We provide comprehensive solutions, ranging from dedicated analyzes, simulations, engineering design, through the selection, testing and certification of materials and structures, to rapid prototyping and additive manufacturing.

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