



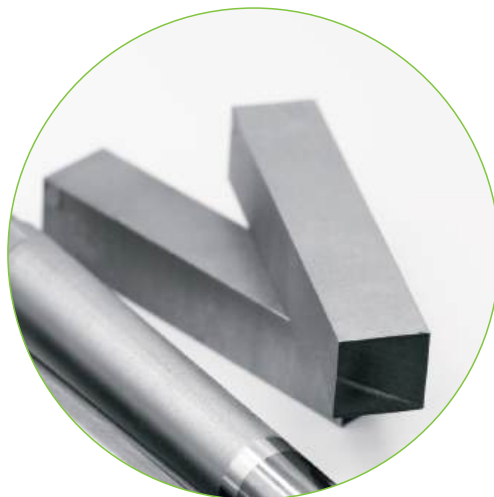
Łukasiewicz
Institute
of Aviation



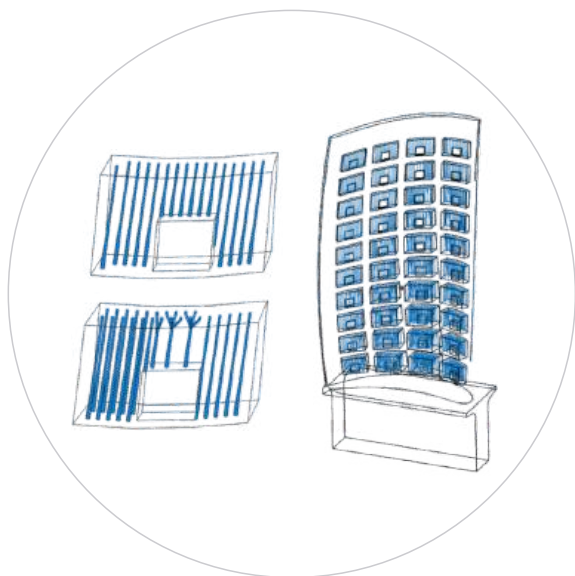
VIBRATION DAMPING TECHNOLOGY **USING** GRANULAR MATERIALS

CHARACTERISTICS

Engineers at Łukasiewicz – Institute of Aviation have developed a vibration damping technology, which has been used and tested in a turbine blade and boring tool prototypes. Vibration damping occurs through the use of one or more cavities filled with powder inside the element. This allows for the transfer of vibration energy into the volume of the granular material, which leads to its dissipation. In addition to the aviation industry, this technology will also find applications in other sectors such as rail transport, manufacturing, and energy industries.



The vibration amplitudes were reduced 82 times [~98.8%].



KEY FEATURES

- The use of granular materials enabled:
 - vibration reduction through increased energy dissipation in the powder,
 - vibration amplitude decrease,
 - product weight reduction,
 - more precise adjustment of the component's operating vibration frequency.
- The versatility of the technology allows for its implementation both the design stage and as an upgrade project for existing structures.
- Vibration reduction decreases the risk of damage or unplanned equipment downtime. It thus contributes to extending the product's lifespan and improving its operational characteristics.

APPLICATION EXAMPLES

- Gas and steam turbines.
- Industrial rotary machines.
- Automotive industry.
- Rail transport.



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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