

# Innovative method for measuring forces and temperature in all type of structures

## Summary

Profile type	Company's country	POD reference
<b>Technology offer</b>	<b>Spain</b>	<b>TOES20250217011</b>
Profile status	Type of partnership	Targeted countries
<b>PUBLISHED</b>	<b>Investment agreement</b>	<b>• World</b>
Contact Person	Term of validity	Last update
<a href="#">Enrico FRANZIN</a>	<b>17 Feb 2025</b> <b>17 Feb 2026</b>	<b>25 Feb 2025</b>

## General Information

### Short summary

A company specializing in innovative product and service development is seeking partners interested in purchasing or licensing one of its patented inventions. The patent covers a novel method for embedding force or temperature sensors in structures or parts. The method is protected under US Patent No. US12025515B2 and European Patent No. EP3978892.

### Full description

This patented method enables the measurement of forces and/or temperatures in specific regions of structures or parts. It involves adding elements to the structure or part in order to generate localized vibration modes, most frequently in the ultrasound range. By analyzing changes in the resonance frequencies of the combined structure and added elements, it is possible to measure the applied forces and/or localized temperature magnitudes. The process follows these key steps:

1. Addition Step: One or more elements are strategically added to the structure, modifying its local vibration properties.
2. Structural Analysis: The behavior of the assembly, consisting of the structure and added elements, is analyzed.
3. Excitation Step: The assembly is subjected to controlled external excitation to induce vibrations.
4. Measurement Step: Variations in resonance frequency associated with the local vibration mode in each

measurement region are measured in real time.

5. Calculation Step: The gathered data is processed to quantify the acting forces and/or temperature in the measuring region.

This method is particularly useful in applications where traditional sensors are difficult to deploy, including:

- **Structural Health Monitoring:** Continuous measurement of stress and strain in automotive, aircraft, and industrial components.
- **Energy & Power Systems:** Monitoring temperature variations and mechanical loads in wind turbines, power plants, and offshore structures.
- **Medical & Biomechanical Applications:** Advanced sensing for prosthetics, orthopedic devices, and biomechanical studies.
- **Aerospace & Defense:** Integration into aircraft, defense equipment, and high-performance structures where reliability and precision are critical.

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#### Advantages and innovations

This method offers several advantages over conventional sensing technologies:

- **Integrable & Adaptable:** It can be applied to existing structures without major modifications, adding value to both new and legacy assets.
- **Sensitive to local magnitudes:** Detects localized static and dynamic forces and/or temperatures, even in harsh environments or difficult to access measuring regions.
- **Overcomes major sensor drift and calibration issues:** Unlike conventional sensors, the resonance-based measurement technique remains stable over time, reducing recalibration and maintenance issues.
- **Robust & cost-effective:** The added elements can potentially be designed to be highly durable and minimize integration costs.

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#### Technical specification or expertise sought

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#### Stage of development

**Concept stage**

#### IPR Status

**IPR granted**

#### IPR Notes

**US Patent No.US12025515B2 and a European Patent No. EP3978892.**

#### Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**

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## Partner Sought

## Expected role of the partner

The expected role of the partner will be to buy the patent or license the patented technology

## Type of partnership

**Investment agreement**

## Type and size of the partner

- **SME 50 - 249**
- **SME <=10**
- **Big company**
- **R&D Institution**

## Dissemination

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## Technology keywords

- **09001005 - Mechanical Technology related to measurements**
- **05003001 - Vibration and Acoustic engineering**

## Targeted countries

- **World**

## Market keywords

- **06002003 - Power grid and distribution**
- **06002002 - Nuclear**
- **09007001 - Construction companies**
- **09007002 - Manufacture of construction materials, components and systems**

## Sector groups involved