



MANAGEMENT OF THE MECHANICAL BEHAVIOR OF STRUCTURES

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Structural Health Monitoring

- A unique position, allowing us to supply remarkable information that is relevant to our clients
- More than 1,000 references around the world
- Cutting-edge algorithms for data processing
- More than 10% of our revenue invested in innovation
- A major player in risk prevention

ISO 9001:2015 certification



Thanks to its expertise and innovative solutions, OSMOS gives managers of structures and engineering and construction companies the possibility of continuously monitoring changes to their structures, in real time.

OUR SOLUTIONS APPLY TO ALL KINDS OF STRUCTURES:

- Infrastructure
- Ancient heritage
- Industry
- Buildings



THE OSMOS GROUP INCLUDES SIAP+MICROS, THE WORLD LEADER IN ENVIRONMENTAL MONITORING SYSTEMS

SIAP+Micros has been designing meteorological instruments since 1925. Over that long period of time, SIAP's equipment has been installed around the world and has proven its quality and reliability.

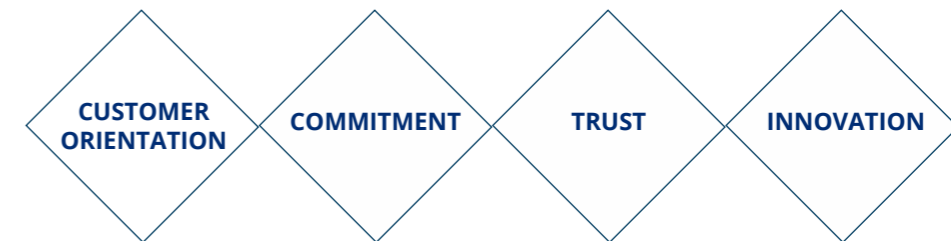
A PIONEER IN STRUCTURAL MONITORING SERVICES

OUR AMBITION

To extend the lifespans of structures, in order to save on the materials and energy needed for new constructions, while ensuring user safety.

OUR COMMITMENT & OUR VALUES

Supplying our clients with high-performance, innovative solutions for the maintenance and operation of all types of structures.



OUR RESEARCH PARTNERS

OSMOS has developed research partnerships with Université Gustave Eiffel, Ecole des Ponts ParisTech, Le Mans Université, University of Strasbourg and University of Zurich, to enrich the state of the art in terms of the study and knowledge of structures and to put it to work for structural health monitoring. The research is then used to develop our data processing algorithms, which enables us to continuously improve the quality of our analyses.

OUR OPERATING PARTNER



Bureau Veritas and OSMOS have partnered up to create the next generation of integrated services, in the fields of structural assessments and asset management.

OSMOS GROUP IS A SUBSIDIARY OF **eren**





SERVICES

PROVIDING THE MOST RELEVANT INFORMATION POSSIBLE

**DIAGNOSTICS &
RECOMMENDATIONS**

**SUPPORT FOR PROJECT
OWNERS**

**INSTRUMENTATION &
CONTINUOUS MONITORING**

**DATA PROCESSING &
INTERPRETATION**

STUDIES & ANALYSES

**WITH OSMOS, RECEIVE SUPPORT FOR YOUR DECISIONS,
SO YOU CAN:**

- **PROACTIVELY MANAGE YOUR STRUCTURES BY ANTICIPATING RISKS**
- **MAINTAIN AN APPROPRIATE LEVEL OF SERVICE**
- **ENSURE THE SAFETY OF PEOPLE AND PROPERTY**
- **ANTICIPATE IRREVERSIBLE DAMAGE AND COSTLY WORK**
- **EXTEND THE LIFESPANS OF YOUR STRUCTURES**
- **CONTROL THE BUDGET ALLOCATED TO STRUCTURAL MAINTENANCE**
- **SCHEDULE AND OPTIMIZE MAINTENANCE AND OTHER WORK**
- **VIEW YOUR STRUCTURES' BEHAVIOR, 24 HOURS A DAY, 7 DAYS A WEEK**

ADVANCED ALGORITHMS:

OSMOS's Science Department creates cutting-edge mathematical tools, designed to improve our analyses, so we can deliver information with maximum precision and pertinence to our clients. For example, we have developed an algorithm that is capable of calculating the total weight and the weight per axle of heavy vehicles and trains passing over a bridge. OSMOS has also devised an algorithm that assesses the state of health of a building's structure after an earthquake.

OSMOS EXPERTISE

TURN TO OSMOS!

EXPERT ASSISTANCE AND SUPPORT FOR PROJECT OWNERS

Assess your structures' state of health, while ensuring user safety.

OSMOS analyzes the **mechanical behavior** of your structures, assesses the severity of any damage and monitors how that damage evolves.

OSMOS works with you, to help you define an effective maintenance policy and schedule targeted repairs, **only when necessary.**

HOW CAN YOU INTEGRATE OUR SERVICES?

OSMOS DATA

DIRECT EXPLOITATION OF DATA ON YOUR STRUCTURAL ASSETS' ACTUAL BEHAVIOR

Reinforce your control of your structural assets by **integrating OSMOS data** with your management and maintenance tools.



Corroborate your studies with your structures' actual behavior and then implement the necessary measures.

Reap the benefits of OSMOS's advanced processing and the results of our mathematical and statistical algorithms.





INFRASTRUCTURE

MAINTAIN YOUR LEVEL OF SERVICE

WHY CHOOSE OSMOS?

Infrastructure requires periodic visual inspections, to monitor its structural health. However, this method of assessment only identifies visible damage. OSMOS monitoring offers the advantages of being precise and non-intrusive and of functioning continuously. It provides access to essential information about structures' actual mechanical behavior and the impact on their operation. For managers, this is an extremely helpful tool for asset management.

MONITORING AND EVALUATING THE IMPACT OF TRAFFIC WITH DYNAMIC STRESS STUDIES



OSMOS's brand of monitoring is unique: the analysis of dynamic stresses yields precise measurements of the impact of passing heavy vehicles on your bridge's mechanical behavior. The OSMOS WiM+D® tool allows you to adapt your infrastructure's level of service and plan ahead for appropriate maintenance actions.

Challenges posed by your structures...

- Receiving real-time structural health assessments
- Controlling structural risks
- Evaluating the impact of operation of your infrastructure on its behavior and adjusting its level of service
- Planning and optimizing your maintenance budget, based on the structure's actual behavior

... benefits offered by OSMOS's services

- Simplified asset management and prolonged lifespans of your structures
- User safety
- Structures in good working order, avoiding costly downtime
- Scheduled, prioritized maintenance and repairs, with the cost of upkeep staggered over time
- Descriptions of the loads passing over your infrastructure (total weight and/or weight per axle), thanks to our WiM+D® solution

Assistance with asset management and preservation of levels of service

Bridges are aging more quickly nowadays, due to their constantly changing usage and increasingly severe weather phenomena, requiring substantial reinforcement work, or even closure to traffic, which is both costly and a burden on users.

Given these challenges, OSMOS's solutions are the most reliable for continuous monitoring and provide a very useful supplement to periodic visual inspections. Analyses of structural monitoring

data yield accurate assessments of a bridge's state of health and the impact of its operation on its mechanical behavior.

Our solutions can help improve how any infrastructure is managed and maintained. By defining a policy for appropriate maintenance and targeted repairs, based on the state of the structure, its lifespan can be extended, and the budget allocated to its maintenance can be optimized.



ANCIENT HERITAGE

PRESERVE YOUR HERITAGE FOR THE FUTURE

WHY CHOOSE OSMOS?

OSMOS continuously studies the real-time mechanical behavior of ancient structures. No matter the materials used or challenges faced by a project, we can help our clients manage their structural risks in the short, medium and long terms. Our services supplement visual inspections, given that our systems are neither intrusive nor destructive to the studied structures.

Challenges posed by your structures...

- Anticipating structural risks and protecting yourself against irreversible damage
- Assessing your heritage assets' state of health and monitoring the evolution of any problems over time
- Obtaining a long-term vision and adopting a preventative approach, in order to prevent emergency situations

... benefits offered by OSMOS's services

- Protection of your assets for future generations
- Control over personal and property safety
- Heritage assets that remain open to the public
- Targeted, scheduled maintenance and renovation work, leading to significant savings
- Control over the structural damage caused by weather events and/or earthquakes

Assistance with heritage preservation and management of structural risks

As witnesses to our past history, ancient heritage structures require great attention to their state of health, particularly for those that are open to the public.

In order to assist contracting authorities and private owners with the preservation of their assets, OSMOS can tailor solutions to specific structural

risk management needs. Our mission is to provide precise, definitive information about heritage structures' actual state of health and to monitor changes in their mechanical behavior over time.

Our expertise in monitoring ancient materials is of benefit to anyone working to safeguard and preserve ancient buildings.



BUILDINGS

MANAGE YOUR RISKS

WHY CHOOSE OSMOS?

By studying the physical parameters in play in critical parts of your buildings, OSMOS goes over and above appearance-based criteria to analyze their mechanical behavior. Enhanced structural monitoring makes it possible to identify any emerging problems, evaluate the severity of any damage and track its evolution over time.

MONITORING AND ANALYZING THE IMPACT OF WEATHER EVENTS AND/OR EARTHQUAKES



The OSMOS SAFE Buildings solution offers a response to the challenges specific to structures that are exposed to seismic and/or weather risks, by analyzing their mechanical behavior. The information derived from our services are of precious help in managing risks and improving building management and upkeep.

Challenges posed by your structures...

- Assessing your buildings' state of health and monitoring the evolution of any problems
- Detecting issues in your buildings early on and managing structural risks
- Obtaining a long-term vision and adopting a preventative approach, in order to prevent emergencies

... benefits offered by OSMOS's services

- Protection against irreversible damage
- Safety of people and property
- Preservation of your buildings' integrity and value
- Anticipation of maintenance and major work, to reduce the cost of upkeep

Structural risk management for your buildings

To assist property managers with the preservation of their buildings, OSMOS offers continuous, real-time monitoring solutions to determine their exact state of health, detect any emerging issues and track changes in existing problems.

Regardless of the type of building, for it to be resistant to the vicissitudes of time and resilient

in its operations, its structural integrity must first be confirmed.

Thanks to analyses of OSMOS's monitoring data, our clients can guarantee the safety of their buildings' occupants, avoid costly (and sometimes needless) work and preserve their structural assets over time.



INDUSTRY

MAINTAIN YOUR PERFORMANCE LEVELS

WHY CHOOSE OSMOS?

OSMOS's solutions go beyond structural monitoring methods based on non-destructive controls and periodic general inspections. By combining monitoring with behavioral engineering, OSMOS can check the exact state of health of a building and evaluate the impact of its operation on how the facility and its support structure behave, in real time. Over time, this will allow you to optimize your facility's operation and maintenance.

Challenges posed by your structures...

- Continuously collecting your industrial assets' behavioral data
- Detecting signs of structural weakness early
- Assessing the impact of use of your facilities on their civil engineering and vice versa
- Overseeing your operations in real time, on site

... benefits offered by OSMOS's services

- Anticipation and redefinition of your facilities' maintenance actions
- Control over the safety of people and of your industrial properties
- Maintenance of your facilities in good working order
- Extended lifespans for your industrial assets

Monitoring and preservation of industrial assets

Within a context of shrinking budgets and rising performance demands, structural health monitoring tools have emerged as a solution capable of cutting control and maintenance costs for civil engineering works and industrial facilities. Whether the need relates to production line

supports, intra- or inter-unit structures, storage facilities, or factories or other industrial buildings, OSMOS offers tailored continuous monitoring services for those structures, which, in many cases, are aging yet still strategic.

