



# ermes

**ELECTROTECHNICS AND MECHANICS OF STRUCTURES**  
R&D EXPERTISE AT THE SERVICE OF INDUSTRY

**FIELD EXPERTISE**

**TESTING AND MEASUREMENTS**

**NUMERICAL SIMULATIONS**

**PROTOTYPED PRODUCT**

**MARKET-READY PRODUCT**

OPERATIONS & MAINTENANCE SUPPORT

## Controlling vibrations of structures in their environment

### YOUR STAKES

- Limit degradation and premature ageing
- Optimize service life and availability
- Make available the equipment quickly

### OUR OFFER

#### The offer includes:

- Analysis of vibration levels
- Development of tailor-made vibration control solutions

Our teams are known for their expertise and can adapt to the most complex situations.

#### The offer can be detailed as follows:

- Specify and perform vibration tests on materials weighing several tons
- Analyze and exploit data (modal analysis, measurements during operations)
- Propose a diagnosis based on numerical models (re-setting, correlation between tests/calculations)
- Develop a solution for controlling vibrations

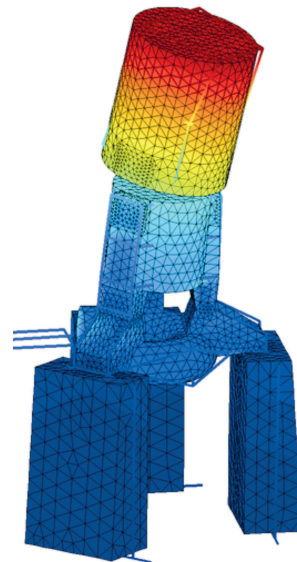
We perform experimental modal analysis under its own drive source: clam, building, pump, motor, piping, ...

#### Tests can be carried out on site or in our test hall.

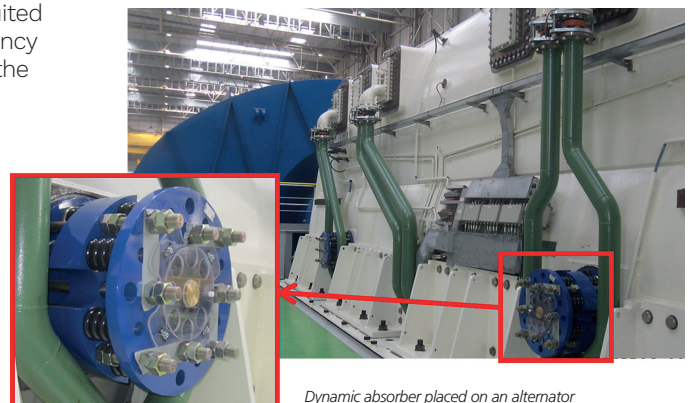
The study material and methodology are suited to the environmental conditions and frequency stimulation conditions (from the lowest to the highest frequencies).

### SECTORS OF APPLICATION

- Energy
- Transports (automobile, aeronautics, railway, marine)
- And any application where a material or a structure is subjected to vibrations



Modeling a pump under vibration loading



Dynamic absorber placed on an alternator

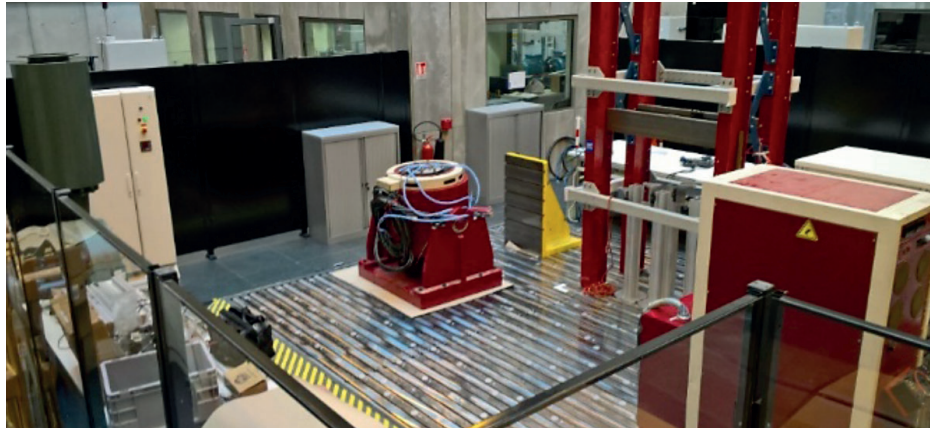
# Controlling vibrations of structures in their environment

## KEY FIGURES:

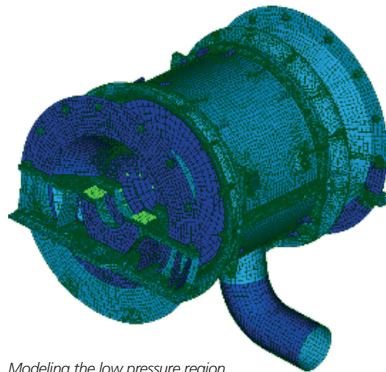
- EVADYN (42 tons): 4m×4m separated from GC (cut-off frequency: 2.5 Hz)
- LMS acquisition platform (180 channels)
- Real-time micro-controller DSpace (16 input + 6 output)
- Vibrating edifices weighing 10N – 27kN
- 140 single axis charging accelerometers
- 110 ICP tri-axis accelerometers
- Laser vibrometer

## OUR ASSETS

- A team with experimental know-how proven by numerous campaigns on our production sites.
- Tests adapted to all types of situations:
  - Multiple excitation points (impact hammers, vibrating pots)
  - Active control of vibration excitation means
  - Wide variety of sensors (Laser displacement sensors, LVDT, Laser Speedometer Accelerometers, Gauges, etc...)
  - Large number of measurement channels
- Numerical simulation tools, based on Code\_Aster (open source thermomechanical solver) hosted in the Salome\_Meca platform.



Evadyn



Modeling the low pressure region of a turbine



## SATISFIED CLIENTS

- EDF's generating facilities: Nuclear, Hydraulics, Wind Power
- GE-Alstom, Framatome, CEA

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## A RICH HISTORY

- Study of the stiffness of fuel assembly grids on impact.
- Active control and hybrid tests on a steam generator tube.
- Vibratory behavior of a vault barrier under ambient noise.
- Characterization of the dynamic behavior of electrical enclosures.