imos®
MONITORING SYSTEM

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STRUCTURAL INTEGRITY TESTING FOR POLES AND MASTS

Foto © Johann Perger

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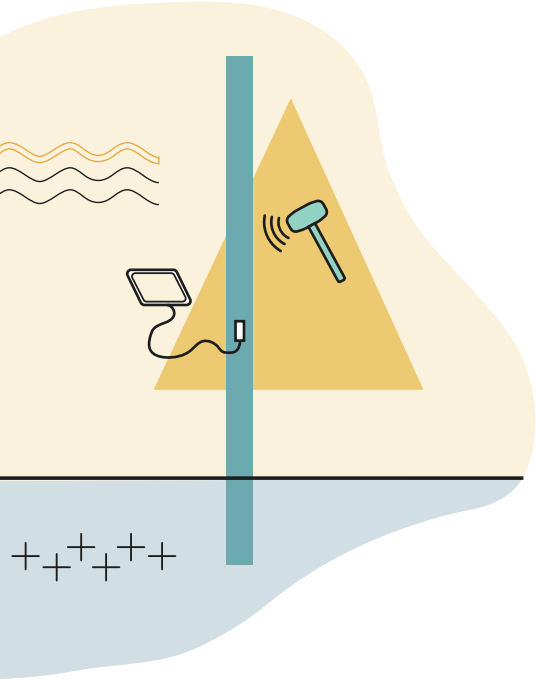


Poles and masts have a limited service life and are exposed to numerous negative influences – external moisture (rain, dog urine, etc.), internal moisture (condensation), aggressive soil conditions, and various loads (wind, signage, cantilever arms, guy wires, etc.). These factors lead, over time, to corrosion-related cross-sectional loss and, consequently, reduced load-bearing capacity as well as material fatigue.

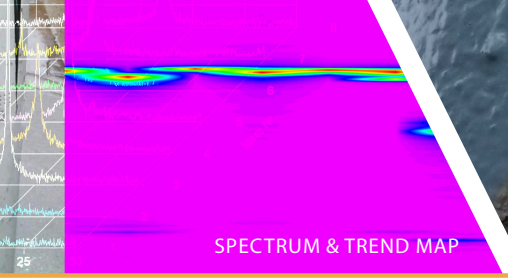
To ensure structural integrity, regular stability inspections are essential.

We offer structural integrity assessments for masts including the following services:

- Instrument-based testing using the **LIMOS®** method and **ultrasonic thickness measurements**
- **Visual condition assessment**
- **Evaluation** of all measurement and inspection data
- **Classification** based on a combination of measurements, visual inspections, and empirical data from our mast database
- **Storage of all data** in a centralized database

YOUR ADVANTAGES

- No traffic restrictions
- Walk-by system (minimal spatial requirements)
- Non-destructive testing
- Preliminary assessment directly on site
- Customizable data transfer to third-party asset management systems


SPECTRUM & TREND MAP


DAMAGE TO LIGHTING POLES

MEASUREMENT METHOD

Poles and masts exhibit distinct vibrational behavior, which can be described using dynamic parameters such as **natural frequencies, mode shapes**, and **damping ratios**. Structural damage and the resulting **loss of stiffness** cause measurable changes in these dynamic parameters. This enables a **reliable and objective assessment** of structural integrity.

A simple and effective method for determining these parameters is the **instrumented identification of the dynamic characteristics** through **ambient vibration measurements**. In this process, the structure's vibration behavior under ambient conditions – i.e., without artificial excitation – is recorded, evaluated, and interpreted using **high-sensitivity accelerometers**.

To support this analysis, **ultrasonic wall thickness measurements** can be carried out. In addition, the results may be compared with a **computer-generated structural model** to gain further insights into the actual load-bearing behavior, the current condition, and to develop **projections regarding the future structural performance**.

DATABASE & GIS

To ensure a fast and efficient inspection process, a **tablet-based solution** has been developed

- Digital inspection forms are completed directly on site using the tablet
- **Integrated GPS** for geolocation
- **Integrated camera** for photographic documentation
- **LIMOS® sensor** directly connected to the tablet
- Software for **automatic data analysis**
- **Comparison** with similar masts in the database

All inspection results, photos, measurement data, etc., are automatically stored in the database. **Structural assessment summary sheets** for reporting are generated automatically. Each mast is **geo-referenced via GPS**. This positional data enables cross-checking and updating of existing spatial data (e.g., shape files) using **GIS software**.

POTENTIAL STRUCTURES FOR TESTING

- Lighting poles / tensioned poles
- Toll gantries
- Wind turbines
- Flagpoles
- Floodlight masts

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