

# Stability of Masts and Poles

## DEKRA Mast Inspections



With the well-known mastap® Method

## Non-destructive and reliable

Whether made of wood, aluminum, steel or concrete – poles have a supporting function in safety and orientation in public space. This is not the only reason why their stability must be regularly checked by recognized experts. Time and time again, accidents caused by poles or masts falling over put the life and health of people at risk, and, naturally, the owners of such faulty poles or masts are held responsible for any resulting damage or injuries. Stay on the safe side with DEKRA: Testing with the modern, non-destructive mastap® measuring method; our experts will make your poles as reliable as they are precise.

### This is how it works

Unlike conventional testing methods, the measurement works without putting the material under mechanical stress, instead, it takes advantage of the fact that every swinging system - thus also each pole - has a typical natural frequency. Based on their specific properties (material, dimensions, wall thickness etc.) DEKRA calculates the optimum natural frequency of poles. For the measurement on site, these are stimulated to vibrations in a controlled manner.

Any deviations from the optimal values are then recorded. This allows exact conclusions to be drawn about the stability of a pole, on possible weak points and damage as well as its overall condition – even underground.

### Types of masts and poles

No matter what material the mast is made of or where it stands, our service is not limited to just one type of masts:

**Compliant with VDE 0210 or equivalent standards**

- > Overhead power line masts for low- and medium-voltage as well as poles for telecommunication lines

**Compliant with DIN EN 40 or equivalent standards**

- > Poles for street lighting
- > Poles for signposts
- > Floodlight poles

- > Traffic light poles
- > Station and track lighting
- > Special masts like bus and train timetable displays
- > Flagpoles

### Still knocking? It is time for Technology!

The mastap® software combines many state-of-the-art processes in one universally applicable calculation and simulation tool. These include optimized iteration processes of Finite-Element-Method (FEM) calculations for identification of the rotation stiffness in the foundation or the oscillation modes. The mastap® technology can be universally applied for column-like structures of a variety of designs (full profiles, hollow profiles, polygon-type cross-sections, gradual or conic cross-sections).

Every pole is individually parameterized. A static calculation is carried out based on a sound mathematical model and complemented by site-specific load assumptions. The input data, measuring results and analysis results of every pole are saved in an online database, also including GPS coordinates and mast identification numbers. This allows authorized persons with online access to request the full set of pole data in order to perform follow-up inspection including automatic assignment of pole characteristics via GPS. This simplifies scheduling of maintenance considerably and enables system operators to assess the risk of failure or loss of substance more efficiently for better planning and economic budgeting.





## Unique without Alternative

With our unique mastap® technology we assess the stability of transmission poles for low- and medium-voltage overhead power lines as well as solid poles for lighting, light signal systems and signposts. The measuring method provides reproducible and damage-free verification of the stability of poles by means of the respective load-bearing and positional safety, taking into account all factors, in particular attachments, material and anchoring of the respective pole, individually according to the material-dependent requirements, e.g. according to DIN EN 40-3-3 (calculated static verification of light columns), VDE 0210 (requirements for overhead lines) as well as DIN EN 1991-1-4 (wind loads) in a way that is tamper-proof and document proof.

If material weaknesses or damages are detected during the inspection, the inspection interval for the next examination is determined accordingly. DEKRA experts do not only carry out the pole inspection non-destructively and reliably for you, but also advise you on all questions of stability, repair and maintenance. Use our services according to your individual needs.

Preparation	On site	Evaluation
<ul style="list-style-type: none"> <li>&gt; Review of the circumstances on site</li> <li>&gt; Determination of the properties of the pole to be tested:               <ul style="list-style-type: none"> <li>– Material (wood, concrete, steel, aluminum, etc.)</li> <li>– Dimensions</li> <li>– Wall thickness</li> <li>– Load distribution</li> </ul> </li> <li>&gt; Anchoring</li> <li>&gt; Determination of the natural frequency</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Measurement               <ul style="list-style-type: none"> <li>– Generating vibration (manually)</li> <li>– Measuring of vibration with mastap®</li> <li>– Acquisition and assignment of measurement data</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>&gt; System stiffness</li> <li>&gt; Material condition</li> <li>&gt; Mechanical damage</li> <li>&gt; Anchoring strength</li> <li>&gt; Stability and projected lifetime</li> <li>&gt; Maintenance periods</li> <li>&gt; Repair requirements</li> <li>&gt; Recommended inspection intervals</li> </ul>

## What DEKRA offers you

Our pole inspections give you the security of being able to effectively prevent personal injury and damage to property. Take advantage of the benefits:

- > Testing by recognized, independent experts
- > Minimization of your liability risks
- > Avoidance of downtimes
- > Non-destructive testing without disturbance of function or traffic
- > Cost security through timely detection of defects and maintenance needs
- > Compliance with legal requirements
- > International uniform availability of DEKRA testing services