

## Testing machine verification

One of the most important functions of dynamometers is the verification of forces generated by testing machines.

### ISO 7500-1 AND 2 STANDARDS

ISO 7500, part 1 and 2 Standards deal with the verification of uniaxial static testing machines for metallic materials.

**ISO 7500-1 Standard:** Tension/compression testing machines - Verification and calibration of the force measurement system.

**ISO 7500-2 Standard:** Tension creep testing machines - Verification and calibration of the force measurement system.

These standards require the use of dynamometers calibrated and classified according to ISO 376, the required precision level depending on the precision of the machine.

Even if ISO 7500-1 and 2 Standards apply to metallic materials, their use is often extended to other types of materials in cases where no specific applicable standard has been issued.

### EN 12390-4 STANDARD

European Standard EN 12390, section 4 deals with the verification of machines used for testing on hardened concrete.

**EN 12390-4 Standard:** Resistance to compression - Characteristics of testing machines:

From the forces point of view, this standard specifies two types of verification:

- The compression force generated by the testing machine on the specimen, which metrological characteristics are measured by using a compression dynamometer previously calibrated and classified according to ISO 376.
- The transfer of compression force to the test specimen. This verification requires a specific compression transducer called "strain cylinder".

### STRAIN CYLINDER

The characteristics of a strain cylinder are thoroughly defined by Standard EN 12390-4. It is a type of dynamometer of a specific shape and size, where the sensitive elements of the transducer are connected in a specific manner. Placed in the position of the specimen, it allows to identify any possible failures in the application of efforts to the specimen and, in particular, to test the efficacy of the top ball-and-socket joint in the testing machine.

This instrument must be calibrated and qualified before use. The LNE in Paris is currently the only one in a position to perform a full calibration of a strain cylinder.