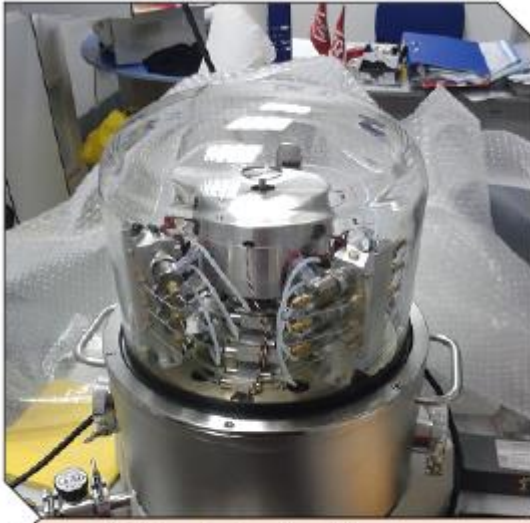


PRESSURE CALIBRATION

Pressure can be described as the amount of perpendicular force acting on a surface per unit area. Pressure units may vary according to the countries and field of use. Pascal is used as the most basic unit in SI unit system. This basic unit was expressed by Blaise Pascal in the mid-1600s.

Turkish Standard Institution Pressure Calibration Laboratories were accredited by Turkish Accreditation Agency and has an experienced and qualified staff. In our laboratory, low measurement uncertainties are reported using high technology devices. TSE Pressure Calibration Laboratories has the principle of providing the fastest and most accurate service.

Motor compression testers, barometers, analogue/digital pressure gauges, differential pressure gauges, manometers, pressure calibrators, pressure transducers, transmitters can be calibrated by TSE Pressure Calibration Laboratory. It is also possible to calibrate specific devices for different sectors; such as paper blasting testers, faucet battery testers and pipe blasting testers.



Pnömatrik dead-weight tester



Manuel pompalı basınç kalibratörü



Azot tüplü otomatik basınç kalibratörü

DIMENSIONAL CALIBRATION

The unit of length of the International Measurement System is meter and is briefly indicated by, "m". Today, 1 meter is defined as the path that monochromatic light takes in 1/299 792 458 seconds in vacuum. This definition has been accepted in order to compare the measurements in various laboratories of the world.

The authorized staff of the TSE Dimensional Calibration Laboratory have participated in the dimensional calibration trainings given by *National Metrology Institute*. In addition, comparison tests are applied between the staff at least once a year.

TSE Dimensional Calibration Laboratory offers a wide range of services. *3D coordination measuring instrument, dimension gauges, CNC machine, steel ruler, applicators, Sieves, flick standard, extensometer calibrator, ring gauge, thread gauges, internal micrometers, thickness foil, thickness gauge measuring instrument, thickness gauges, angle gauges, calipers, spheres, micrometers, dial gauges, block gauges, penetrometers, profile projector, universal measuring instruments, long block gauges, V bearings, height measuring device, surface roughness reference devices* can be calibrated in the TSE Dimensional Calibration Laboratory. It is also possible to calibrate devices subject to dimensional measurements in different sectors.



MECHANICAL CALIBRATION

Our mechanical calibration laboratories have been *accredited* according to internationally accepted standards aimed to provide fast and accurate service to customers. Our calibration certificates are

valid in the countries abroad. With our high accuracy reference devices and low uncertainty values, the results of our comparisons between laboratories and experienced staff, we provide calibration services with the highest quality.

Mechanical calibration services are provided by our authorized mobile staff, where the devices are located. Please get contact for the details and your requests. Your devices can be calibrated by coming to your institution / organization as soon as possible.

Mechanical Calibration Laboratory has got highest facilities and reference devices which are traceable to the *international standards*. Reference devices are regularly subjected to intermediately checks and maintenances. The reference devices at the highest level of accuracy are preferred and used by TSE staff.

Tensile, compression, bending, spring force testing machines, concrete testing machines, hardness testers, impact test machines, extensometers, shore-meters and balances can be calibrated by mechanical calibration staff. Also, service is provided for calibrations of various devices subject to the different sectors.



TEMPERATURE CALIBRATION

TSE Temperature Calibration Laboratories are capable of presenting measurement services at all stages of traceability with their reference standards. TSE Temperature Calibration Laboratory; is a leader with high measurement capability, wide range of devices and expert calibration staff.

Measurements can be performed using primary level standards or other temperature sources using fixed points, corresponding to the level of accuracy of test device and accuracy requested by the customer. Industrial and scientific calibration are included in the scope of activity of our laboratory. TSE Temperature Calibration Laboratory is accredited by *TURKAK* according to *TS EN ISO IEC 17025*.

Block calibrator and indicator, thermometers, multi-channel thermometers, resistance thermometers (SPRT, PRT, industrial type etc.), oven, incubator, shaker, bain-marie, autoclave,

water bath, freezer, thermocouple, cold room, air conditioning cabinet, radiation thermometer, liquid glass thermometer, temperature simulator, clinical thermometer, thermistor, thermostat, ash furnace can be calibrated by our staff. In addition, calibrations of temperature measurement devices subject to different sectors can be performed.



HUMIDITY CALIBRATION

TSE Humidity Calibration Laboratories can calibrate **digital / analog humidity meters** with the help of NIST-proven two pressure humidity generator and provide traceability by working with precise measurement uncertainties.

In addition, **wood moisture meter devices** used in the determination of moisture of wood can be calibrated in TSE Humidity Calibration Laboratory.



ELECTRICAL CALIBRATION

Our laboratory, which has more than 10 years accreditation history, calibrates the electrical devices in almost every subject required by the industry. The services are provided by trained and qualified personnel, mostly engineers and technicians who have undergraduate and graduate education.

AC / DC Transfer Standard, AC Calibrator, Battery Tester, Low Voltage Supply, Analog Ammeter / Voltmeter, Analog / Digital Wattmeter, Analog Multimeter, Analog Clamp Multimeter, Audio Analyzer, Cos Fi Meter, Multifunction Calibrator, DC Calibrator, DC Reference Digital Ammeter / Voltmeter, Digital Clamp Multimeter, Resistor Box, Electrical Safety Tester, EMI Receiver, Inductance Meter, Frequency Counter, Power Analyzer, Power Etalon, Power Sensor, Signal Generator, Leakage Current Tester, Capacitance Meter, Stopwatch, Lcr Meter, Milliohmmeter, Ohmmeter, Oscilloscope, Oscilloscope Calibrator, Rf Amplifier, Rf Wattmeter, Spectrum Analyzer, Standard Resistor, Standard Capacitor, Standard Inductance, Tachometer, Thomson Bridge, Ground Resistance Meter, Transformer Ratio Measurement Device, Insulation Tester, High Current Source, High Voltage Supply / Divider / Attenuator calibrations can be performed. Calibrations of special devices subject to different industries can also be performed.



LCR Metre



Frekans standardı ve modülasyon analizörü



Multimetre (8,5 dijit) ve kalibratör

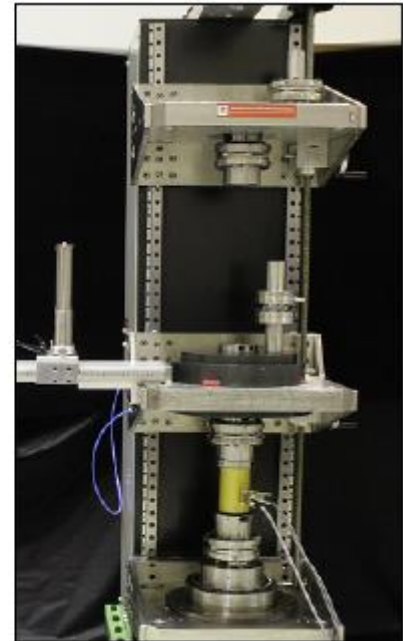
TORQUE CALIBRATION

Control of industrial products during and after production is inevitable. Torque measurements in industry are widely used in manufacturing and process control areas. In addition, torque measurements are frequently applied by R&D or PU-GE units of companies in the research and development of new technologies. Most processes in the automotive industry include about 35% bolting operations, and *torque tools* (torque wrenches, torque screwdrivers, torque guns, etc.) are often used for these operations. For this reason, the controls of the accuracy of the torque tools used during the assembly in the post-installation are extremely important and torque tools must be checked, maintained, repaired and calibrated at regular intervals.

The staff employed in the TSE Torque Calibration Laboratory participated in Torque Calibration Trainings given by National Metrology Institute and were authorized according to the procedures after a certain number of observations, practices. In addition, comparison test between staff are performed least once a year.

TSE Torque Calibration Laboratory is designed in accordance with the standards for laboratory conditions. In the TSE Torque Calibration Laboratory, ambient conditions are always under control. Devices that come to Torque Calibration Laboratory are conditioned for at least 24 hours in laboratory conditions.

Torque hand tool, torque hand tools calibration system, high accuracy torque wrench and torque transducers can be calibrated in our laboratory.



HARDNESS-FORCE CALIBRATION

Reference load cells and hardness plates are used for verification and calibration of material testing machines. Calibration is required to ensure traceability of the reference load cells and hardness blocks.

In the TSE Force and Hardness Calibration Laboratory, which is the product of the development activities in a special project carried out with the cooperation of the Turkish Standards Institute and NMI, calibration of *hardness blocks* and *load cells* is carried out with high precision and low measurement uncertainties.



ACOUSTIC CALIBRATION

As the volume increases, it can become harmful to human health. In daily life, noise can often be exposed to unwanted situations. It is possible to see the level of noise with an effective noise measurement. It is necessary to determine the noise with the correct measurement. It is necessary to determine whether your device is within the tolerances.

TSE Gebze Calibration Directorate is able to perform calibrations of *sound level meter*, *acoustic calibrator* and *sound dosimeters* in the most accurate way within the framework of TURKAK accreditation.



VOLUME CALIBRATION

Calibration of *volumetric glass materials* and *piston volume devices* are performed in TSE Volume Calibration Laboratory used in chemistry, food, health, microbiology and various other industrial laboratory tests.



MASS CALIBRATION

In the Mass Calibration Laboratory, calibrations are performed according to the instructions and procedures based on the OIML R111 document. The masses are cleaned using appropriate liquids and solutions prior to calibration and kept under laboratory conditions for at least 24 hours. According to the weight class, number of cycles specified in *OIML R111* are selected.

Dead weights, hook weights etc. which are frequently used in test and measurement laboratories, also require control and calibration, such as standard masses. In mass calibration laboratory, conventional mass values can be determined for these type of weights.



Referans Kütlelerimiz

SPECIAL/OTHER CALIBRATIONS

Led measurements, textile devices measurements, calibration of paper cutting devices, friction devices, perspirometers and spectrophotometers etc. can be performed. In addition, *optical measurements*, *air velocity measurements*, *thermal measurements* are carried out and you need to contact for special calibration / measurement requests (Please contact: gkm@tse.org.tr).

