



TORQUE METROLOGY

Aim of Course

This course will benefit anybody who performs torque measurements either for the purpose of calibrating Torque Transducers or calibrating Torque Tools. It aims to provide an understanding of the methods of calibrating, operating and maintaining torque measurement systems. It will improve their understanding of torque measurement principles, the selection of appropriate instrumentation and the estimation of uncertainty of their torque measurements.

Pre-Requisites for attending this course

The satisfactory completion of the following courses is preferred:

- Introduction to Measurement course
- Method Validation (Calibration) course
- Uncertainty of Measurement – GUM (Physical) course

Course Overview

Introduction

- Theory: Stress, Strain, Young's Modulus
- Torque Fundamental's

Torque measurement

- Electrical Circuit (Wheatstone bridge)
- Strain Gauges
- Readout Units
- Types of Torque Transducers
- Choosing the correct Torque Transducer for the application

Generic Calibration of Torque Transducers

- Preliminary measures
- Overload test
- Verification relating to application of torques
- Resolution of the indicator
- Analogue scale
- Digital scale
- Variation of readings
- Units
- Minimum torque

Calibration Methods

Calibration of Torque Transducers by deadweight

- DIN 51309: Materials testing machines Calibration of static torque measuring devices

Calibration of Torque Transducers by comparison

- DIN 51309: Materials testing machines Calibration of static torque measuring devices

Calibration of Torque Tools

- ISO 6789: 2017 Assembly tools for screws and nuts — Hand torque tools — Part 2: Requirements for calibration and determination of measurement uncertainty
- Torque Wrenches
- Torque Screwdrivers

Analysis of the calibration data

Measurement error and uncertainty

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TORQUE METROLOGY (CONT.)



Practical Demonstrations

Who should attend

Metrologists and quality practitioners wishing to learn the fundamentals of torque measuring principles, and how to perform calibrations of various instruments and devices. Attendees of this course should preferably have previous experience of metrology work and inspection procedures.

Course Duration

4 Days

Evaluation

Daily tests and the passing of a final examination are required to successfully complete this course.

The examination will be written approximately two weeks after the completion of the course.

