



TORQUE METROLOGY PART 1

Aim of Course

This course will benefit anybody who performs calibrations of Torque Tools such as Torque Wrenches and Torque Screwdrivers. Learners are introduced to numerous other torque tools in use in industry. It aims to provide an introduction to torque measurement principles and how these are applied in the calibration of torque tools specifically. Learners will be guided through the international method ISO 6789:2017 for these calibrations which includes the calculation of the measurement uncertainty and generation of the calibration certificate. Various Torque Tools will be practically calibrated by the learners during the course.

Pre-Requisites for attending this course

The satisfactory completion of the following courses is *strongly* recommended:

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

Course Overview

Introduction

Fundamentals of Torque

- Definitions
- Expression in measurement units
- Uses of torque
- Aspects of bolt tightening

Measuring Torque

- Mechanical deformation
- Electrically detecting this deformation
- Strain Gauges
- Wheatstone Bridge
- Readout Units
- Torque Transducers

Calibration of Torque Tools

Examples of different types of torque tools

By means of Reference Transducers

- Principles
- Use of Rigs
- ISO 6789:2017
- Use of polynomial equations to import metrological traceability
- Measurement Uncertainty Estimation
- Practical calibration tasks

Who should attend?

Metrologists and quality practitioners wishing to learn the fundamentals of torque measuring principles, and how to perform calibrations of torque tools. 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.

National Laboratory Association
South Africa

PO Box 298 • Persequor Park • 0020
1 De Havilland Crescent • Persequor
Technopark • Pretoria • South Africa

Tel: +27(0)12 349 1500 • Fax: +27(0)12 349 1501

www.nla.org.za