National Measurement System

National Measurement System Guidance Documents

Underpinning Metrology

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Document Title and Hyperlink	Document Description
A beginner's guide to uncertainty in measurement.	The guide explains the concept and importance of measurement uncertainty, using examples from everyday life. It illustrates how to estimate uncertainty in real measurement situations, showing a detailed uncertainty calculation step by step.
Accreditation for Microbiological Laboratories	This document supplements ISO 17025 by providing specific guidance for both assessors and for laboratories carrying out microbiological testing.
Best Practice Guide for Generating Mass Spectra	The guide takes the user, step-by-step, through the process of generating mass spectra that are fit for purpose.
Calibration and use of Optical Time Domain Reflectometers (OTDR).	This document describes the calibration of Optical Time Domain Reflectometers (OTDR).
Callipers and micrometers.	This guide covers the use of callipers and micrometers for internal, external and depth measurements.
Determination of residual stresses by magnetic methods.	This guidance document describes determination of residual stresses by magnetic methods.
Determination of residual stresses by X-ray diffraction.	This guide is applicable to X-ray stress measurements on crystalline materials.
Discrete model validation.	This Best Practice Guide, a companion guide to SSfM Best Practice Guide No. 4 Discrete Modelling, looks at validation techniques for the main components of discrete modelling.

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Discrete modelling.	This Best Practice Guide for discrete modelling covers all the main stages in experimental data analysis.
Elastic modulus measurement.	The Good Practice Guide draws together some of the background to the techniques, discusses the current standards, and highlights a number of key factors crucial to obtaining good quality measurement.
Estimating uncertainties in testing	This guide presents principles and guidance for the estimation of measurement uncertainty.
Eurachem Guide: The Fitness for Purpose of Analytical Methods. A Laboratory Guide to Method Validation and Related Topics	A guide for laboratory managers responsible for setting up and evaluating validation studies, as well as for analysts carrying out validation work.
EURACHEM Guide: The selection and use of reference materials	This guide gives detailed guidance for the establishment of measurement traceability in quantitative chemical analysis and will assist laboratories in meeting the traceability requirements of ISO 17025.
Eurachem/CITAC Guide: Measurement uncertainty arising from sampling: A guide to methods and approaches	This Guide aims to describe various methods that can be used to estimate the uncertainties arising from the processes of sampling and the physical preparation of samples.
Eurachem/Citac Guide: Quality Assurance for Research and Development and Non-routine Analysis	This guide provides those working in the non-routine environment with advice on good practice to facilitate the implementation of quality systems.
Eurachem/Citac Guide: Quantifying Uncertainty in Analytical Measurement, 2nd Edition	This guide gives detailed guidance on the evaluation of uncertainty in quantitative chemical analysis, based on the approach taken in the ISO 'Guide to the Expression of Uncertainty in Measurement'.
EURACHEM/CITAC guide: Traceability in chemical measurement	This guide gives detailed guidance for the establishment of measurement traceability in quantitative chemical analysis and will assist laboratories in meeting the traceability requirements of ISO 17025.

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Eurachem/CITAC Guide: Use of uncertainty information in compliance assessment	The guide is applicable to decisions on compliance with regulatory or manufacturing limits where a decision is made on the basis of a measurement result accompanied by information on the uncertainty associated with the result.
Finite element analysis of piezoelectric ceramics.	This guide is intended to help people wanting to do finite element analysis of piezoelectric materials.
Flow Measurement Uncertainty and Data Reconciliation	This good practice guide describes Flow Measurement Uncertainty and Data Reconciliation
Force.	The guide aims to help anyone wishing to measure force in any industrial or laboratory environment. (not available to download, must be requested)
Fractography of brittle materials.	Covering the methodology for viewing fractured fragments of brittle components such as high-strength ceramics and hard metals, tracing the path of fracture and identifying the fracture origins.
Fundamental good practice guide in the design and interpretation of engineering drawings for measurement processes	This good practice guide is written for engineers, designers and metrology technicians who wish to understand the basics of the interpretation of engineering drawings in relation to the measurement process.
Fundamental good practice in dimensional metrology.	This good practice guide is written for those who need to make dimensional measurements but are not necessarily trained metrologists.
General approach and procedures for erosive wear testing.	This guide aims to provide guidance on erosive wear testing.
General approach and procedures for unlubricated sliding wear tests.	This Guide will provide introductory guidance on unlubricated sliding wear testing.

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Good practice guide to phase noise measurement.	This guidance document describes good practice in phase noise measurement.
Good Practice Guide: Introduction to Flow Meter Installation	This good practice guide describes Good Practice Guide: Introduction to Flow Meter Installation Effects
Guide to mechanical tests for hardmetals.	This guidance document describes mechanical tests for hardmetals.
Guide to Quality in Analytical Chemistry: An Aid to Accredition	The aim of this guide is to provide laboratories with guidance on best practice for the analytical operations they carry out.
Guide to the calibration and testing of torque transducers.	This guide describes a collection of methods for the calibration of a torque transducer. It encompasses transducers based on different technologies and transducers that operate in both static and dynamic applications.
Guide to the Measurement of Humidity	A detailed guide to many aspects of humidity measurement. It covers humidity concepts and definitions, methods of measurement, instrument performance and calibration, and good measurement practices for humidity. (not available to download, must be requested)
Guide to the measurement of smooth surface topography using coherence scanning interferometry.	This guide describes good practice for the measurement and characterisation of smooth surface topography using coherence scanning interferometry.
Guidelines for in-house production of Reference Materials - Version 2	The guidelines highlight the key issues that analysts should take into account when preparing reference materials in-house.
How to Increase Confidence in Flow Measurement Data	This guidance document describes How to Increase Confidence in Flow Measurement Data

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Human factors in measurement and calibrations.	This guide takes as its central theme the impact of human strengths and weaknesses on the accuracy and efficiency of measurement calibration services.
Improving the consistency of particle size measurement.	The principal causes of variability in particle size measurement, particularly in the sub-sieve range of 50 µm to sub 1 µm are summarised.
Laboratory Skills Training Handbook	The aim of the Laboratory Skills Training Handbook is to provide a basic training package in key laboratory skills and to provide an introduction to important quality topics.
Laboratory test procedures to high temperature steam atmosphere.	The influence of various experimental parameters, which can be controlled in the laboratory, on the steam oxidation response of materials is discussed and recommendations for best practice are proposed.
Mass & Weight -	This Guide offers valuable information about a wide range of issues affecting weighing from traceability to practical aspects of weighing. (not available to download, must be requested)
Measurement of high field dielectric properties of piezoelectric materials.	These guidelines are intended to enable a user to perform high field dielectric measurements on piezoelectric ceramic materials such as PZT (lead zirconium titanate).
Measurement of Temperature in Flow Metering Installations	This guidance document describes Measurement of Temperature in Flow Metering Installations
Measuring piezoelectric d33 coefficents using the direct method.	This guide will examine the advantages and disadvantages of the direct method.
Meeting the traceability requirements of ISO 17025: An analyst's guide (3rd ed)	This guide provides essential practical advice to analysts and laboratory managers on how to establish the traceability of their results to reliable and appropriate measurement standards

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Method of measuring piezoelectric displacement in piezoelectric ceramics.	This Good Practice Guide is intended to aid a user to perform displacement measurements on piezoelectric ceramic materials such as PZT (lead zirconium titanate) in either monolithic or multilayer form.
Methodology for Accurate Mass Measurement of Small Molecules	The aim of this guide is to provide users and suppliers of Accurate Mass instrumentation with a clear summary of the essential steps in obtaining reliable data.
Piezoelectric resonance.	This Guide is intended to help a user to perform resonance spectra measurements on piezoelectric ceramics.
Polarisation effects and measurements in optical fibre systems.	This document has been written to give guidance and understanding to the array of polarisation properties and effects found within optical fibres, optical fibre components and optical fibre systems.
Preparation of Calibration Curves: A Guide to Best Practice	The aim of this guide is to highlight good practice in setting up calibration experiments, and to explain how the results should be evaluated.
Pressure & Vacuum.	This guide provides advice for those wishing to select and use instruments for measuring pressure or vacuum.. (not available to download, must be requested)
Qualitative Analysis: A Guide to Best Practice. Forensic Science Extension	This guide presents a set of generic principles covering best practice in qualitative analysis, focusing on issues specific to forensic science.
Radiometric non-destructive assay.	This guide provides recommended procedures for the operation, testing and calibration of equipment used for radiometric non-destructive assay of fissile and radioactive materials.
Regular transmittance measurements.	This document is a guide to the assessment of spectrophotometers that are used to make regular transmittance measurements of optical radiation at ultra-violet (UV), visible and near infrared (NIR) wavelengths from 200 nm to 3000 nm.

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Rotating wheel abrasive wear testing.	This Measurement Good Practice Guide aims to provide introductory guidance on abrasive wear testing.
Selecting a Flow Meter	This guidance document describes Selecting a Flow Meter
Slip flow measurement by capillary extrusion rheometry.	This guidance document describes slip flow measurement by capillary extrusion rheometry.
Software in scientific computing. .	This guide provides a means for suppliers and users of software to assure themselves of the quality of software
Software re-use: guide to METROS. Surface colour measurements.	The guide describes METROS (the METROlogy Software environment) which is a system to provide metrologists access to software appropriate to their needs. This document is a guide to the measurement of surface colour. It is primarily concerned with visible wavelengths of light in the range 360 nm to 780 nm.
The assessment of uncertainty in radiological calibration and testing	This guidance document describes the assessment of uncertainty in radiological calibration and testing
The calibration and use of piston pipettes.	This guidance document describes the calibration and use of piston pipettes.
The development and application of guidance on equipment qualification of analytical instruments	This document provides guidance on equipment qualification (EQ) of analytical instruments.

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The guide to the preparation and testing of bulk specimens.	This guide describes methods for preparing bulk specimens of adhesives and methods for testing these for the determination of mechanical property data needed for design.
The measurement of mass and weight.	This Good Practice Guide is intended as a useful reference for those involved in the practical measurement of mass and weight.
The measurement of surface texture using stylus instruments.	This guide covers the measurement of surface texture using a stylus instrument.
The metallographic measurement of WC grain size.	This guide details recent developments in understanding the measurement issues.
The scratch test: calibration, verification and the use of a certified reference material.	This guide aims to help you get the best out of your scratch tester.
The use of finite element methods for design with adhesives.	This guidance document describes the use of finite element methods for design with adhesives.
The use of GTEM cells for EMC measurements.	This guide is aimed at users of GTEM cells.
Uncertainties in surface colour measurements.	This guidance document describes the uncertainties in surface colour measurements.
Uncertainty and statistical modelling.	This guide provides best practice on the evaluation of uncertainties within metrology, and on the support to this topic given by statistical modelling.

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Uncertainty in Open-channel Hydraulic Structures using Ultrasonic Level Gauges	This guidance document describes Uncertainty in Open-channel Hydraulic Structures using Ultrasonic Level Gauges
UV embossed optical microstructured surfaces.	The purpose of this guide is to draw attention to the possibilities and benefits of using UV embossing process for the production of optical microstructured surfaces.