

Calibration Guides and Expert Reports in Length measurement

Reference	Title
GPG40	Callipers and micrometers Callipers and micrometers GPG40 - NPL
GPG149	Care and use of gauge blocks Care and use of gauge blocks GPG149 - NPL
GPG41	CMM measurement strategies CMM measurement strategies GPG41 - NPL
GPG43	CMM Probing CMM Probing GPG43 - NPL
GPG42	CMM Verification CMM Verification GPG42 - NPL
GPG130	Co-ordinate measuring machine task-specific measurement uncertainties Co-ordinate measuring machine task-specific measurement uncertainties GPG130 - NPL
GPG80	Dimensional metrology guide Dimensional metrology guide GPG80 - NPL
GPG111	Improving the consistency of particle size measurement Improving particle size measurement consistency GPG111 - NPL
GPG116	Measurement of rough surface topography using coherence scanning interferometry Measurement rough surface topography coherence scanning interferometry - NPL
GPG148	Measurement of the surface texture of large roller bearings Measurement of the surface texture of large roller bearings GPG 148 - NPL
GPG138	Strategic planning for coordinate metrology Strategic planning for coordinate metrology GPG138 - NPL
GPG147	Surface texture measurements of gear surfaces Surface texture measurements of gear surfaces GPG147 - NPL

NPL Good Practice Guides (GPG)

NPL's Good Practice Guides are a practical and informative series of documents designed to meet the needs of industry. They are a user-friendly way to find out about what to measure, how to measure it and how to understand the results. Based on NPL's expertise and experience, the guides will enable you, your customers and your suppliers to be in agreement on measurement issues.

GPG40	This guide covers the use of callipers and micrometers for internal, external and depth measurements. The issues covered include the effect of measurement force, both when a ratchet is present (e.g., micrometers) and when it is not, particularly when measuring soft materials; use and general care, support and handling of micrometers and callipers; guidance on choosing the most appropriate equipment type for the measurement; advice on calibration and verification methods and how to generate an uncertainty budget for a measurement; use of electronic instruments, fault awareness, temperature effects; awareness of errors introduced into internal knife edge jaws as external/internal jaws wear; and standard calibration methods and reporting of results.
GPG149	After reading this good practice guide, you will better understand the care and use of gauge blocks. The content is written at a simpler technical level than many of the standard textbooks to make it accessible to a wider audience. We are not trying to replace textbooks, operators' manuals, specifications and standards, but rather present an overview of good practice and techniques.
GPG41	This guide covers the selection of the number of measurement points when using Co-ordinate Measuring Machines (CMMs) and gives advice on the compromise between accuracy and speed. It provides guidance on sampling criteria for standard features and advice on measurements that involve projections of features over long distances. It covers cleanliness, part loading/alignment and the effect of temperature, surface finish and geometry on the result. It also contains information on basic measurement principles, common measurement requirements, CMM software functionality in relation to drawing requirements and good metrology practice when using CMMs with CAD data to inspect parts.
GPG43	This guide is a general guide on probes and probing. It covers probing practice; types of contact probing systems, their advantages and disadvantages and how they work. It also covers the advantages and disadvantages of various stylus configurations.
GPG42	After reading this Good Practice Guide you will be able to better understand the specifications relating to co-ordinate measuring machines.
GPG130	This guide covers methods to ascertain the measurement uncertainty associated with measurements made on a co-ordinate measuring machine. It describes the need to take in to account measurement uncertainty when making measurements on co-ordinate measuring machines. Methods for determining task-specific measurement uncertainties are covered with particular reference to ISO 15530.
GPG80	This good practice guide is written for those who need to make dimensional measurements but are not necessarily trained metrologists. On reading this guide you should have gained a basic knowledge of fundamental good practice when making dimensional measurements. An introduction to length units and key issues such as traceability and uncertainty is followed by some examples of typical sources of error in length measurement.

	Checking to specification, accreditation and measurement techniques are also covered along with an introduction to optical measurement techniques.
GPG111	The principal causes of variability in particle size measurement, particularly in the sub-sieve range of 50 μm to sub 1 μm are summarised. The causes are illustrated with results of measurements from a series of round robins made to test reproducibility under different levels of prescription in the procedure followed.
GPG116	The purpose of this guide is to describe good practice for the measurement and characterisation of rough surface topography using coherence scanning interferometry (commonly referred to as vertical scanning white light interferometry).
GPG148	Rolling bearings are common in mechanical systems and are used to reduce friction between rotating components. The performance and lifetime of the bearings is closely linked to the surface texture of their raceways. This guide outlines good practice for surface roughness measurement of bearings, building upon the recommendations of previous good practice guides. Common roughness parameters used when studying bearings are discussed, and differences in terminology clarified.
GPG138	This guide is intended to provide an outline documenting the knowledge necessary to successfully achieve an understanding of the steps required when strategically planning for coordinate metrology.
GPG147	In this guide, the authors aim to provide simple guidance for readers seeking to understand gear surface texture measurements made using stylus instruments. Target readers include designers of gears who require knowledge of gear measurements, gear manufacturers who would like to control the quality of the gear surface manufactured and metrologists who would like to perform measurements of gears. The content is written at a technical level that requires prior knowledge of Measurement Good Practice Guide 37, 'The measurement of surface texture using stylus instruments' [1], and basic knowledge of uncertainty evaluation. This guide is focused on general measurement tasks, and it is not the authors' intention to cover all potential measurement tasks.