

# GD&T- NPL Level 2 to ASME Y14.5 1994

*an accredited training course in the National Physical Laboratory Training Framework*

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associates**

**benefits of using Geometric Dimensioning & Tolerancing (GD&T) correctly include improved productivity, reduced costs and enhanced quality**

- larger tolerance zones
- less ambiguous specifications
- the facility to tolerance form and relationships such as coaxiality
- uses datum structures that manufacturing and inspection can benefit from
- fewer disputes over compliance or non-compliance of components
- reduced scrap and re-work rates
- fewer queries due to incomplete specifications
- simplifies tolerance calculations to ensure correct fit and function

## What do you learn on this course?

### specifiers learn:

- more advanced datum structures, such as datums based on multiple features
- how to use the Maximum Material Condition modifier with zero tolerances
- how to use the Least Material Condition modifier with geometric tolerances
- how to use the Maximum Material Condition modifier with datum references (datum shift)
- how to work with composite tolerances (FRTZF and PLTZF)
- how to use and specify projected tolerance zones

### interpreters learn:

- how to interpret datums based on more than one datum feature
- how to interpret the Maximum Material Condition modifier when used with a zero tolerance
- how to interpret the Least Material Condition modifier when used with geometric tolerances
- how to interpret the Maximum Material Condition modifier when applied to a datum reference (datum shift)
- how to interpret composite tolerances (FRTZF and PLTZF)
- how to interpret projected tolerance zones

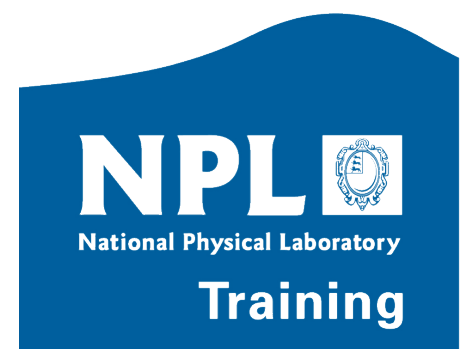
## Who is the course for?

The Geometric Dimensioning and Tolerancing Level 2 course is intended for anyone who needs to apply or interpret GD&T on engineering specifications, and to build on the understanding gained from the Level 1 course. The course is suitable for designers, manufacturing engineers and technicians, QC and inspection staff.

## What prior knowledge is required?

Delegates should be familiar with the conventions of engineering drawing, such as projections, cross sections, representations of features such as screw threads, dimensions and  $\pm$  or limit tolerances.

Delegates should also have completed the GD&T Level 1 course.



**to book a course, call us on 0161 96 96 939 or email [info@g-tol.co.uk](mailto:info@g-tol.co.uk)**

**[www.g-tol.co.uk](http://www.g-tol.co.uk)**

# Course details:

- ❑ **Duration**  
The course lasts for two days
- ❑ **Venues**  
These training courses are normally delivered on-site for clients. Off-site venues can also be arranged.
- ❑ **Certification**  
Delegates who successfully complete the course are awarded an NPL Training certificate which is also recognised by The National Skills Academy for Manufacturing.
- ❑ **Course topics**
  - ❑ Review of fundamentals covered in Level 1
  - ❑ Advanced datum structures
    - ❑ datums with offsets
    - ❑ datums based on multiple features
  - ❑ Maximum Material Condition modifier used with zero tolerances
  - ❑ Use of the Least Material Condition modifier with geometric tolerances
    - ❑ Least Material Virtual Condition
    - ❑ Least Material bonus tolerance
  - ❑ Application of Maximum Material Condition modifier to datum references
    - ❑ calculation of datum shift allowance
  - ❑ Composite tolerances
    - ❑ FRTZF and PLTZF
    - ❑ different ways of controlling patterns or groups of features
  - ❑ Projected tolerance zones

## The NPL Training Framework

The NPL training framework has been developed in partnership with industry with the following objectives:

- to develop core skills and competencies in practitioners
- to raise the level of technical knowledge
- to promote and instil good practice
- to foster a questioning and planning culture

The NPL training programmes are accredited by **NPL**, validated by **The National Skills Academy for Manufacturing**, and delivered only by **NPL Accredited Training Providers**.

**Iain Macleod Associates** is an **NPL Accredited Training Provider** and an **Approved Supplier to BAE SYSTEMS**.

Iain Macleod has been teaching Geometrical Tolerancing and GD&T for nearly two decades. He chairs BSI technical committee TDW/4/8 which is responsible for the development and maintenance of BS 8888.

Iain Macleod also represents the UK on ISO Technical Committee TC213 Working Group 18, which is responsible for the development of ISO standards for GD&T and GPS.

In addition, Iain Macleod is the UK representative on the ISO study group (jointly chaired by Archie Anderson of ASME and Renald Vincent of AFNOR) which is currently identifying and mapping the differences and commonalities between the ISO GPS system and the American ASME Y14.5 standard.

Iain Macleod Associates provide training and consultancy in:-

- *Geometrical Tolerancing*
- *Geometrical Product Specification*
- *BS 8888 & ASME Y14.5*
- *Tolerance Stack Calculations*

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