

Metrology, Basic Definitions

Metrology Notes for GATE Exam

Metrology Definition

What do you understand by Metrology?

- It is basically the science of measurement.
- The purpose of this discipline is to establish means of determining physical quantities.

Important Terminologies

Nominal Size

This is used for general identification purposes and the size of any part is defined during its drawing.

Basic Size

The size of a part to which all limits of variation are applied. It is a theoretical concept.

Actual Size

It is the actually measured dimension of a part.

Note: The difference between basic and actual size should not exceed certain limits otherwise it will interfere with the interchangeability of the mating parts.

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Upper or High or Maximum Limits

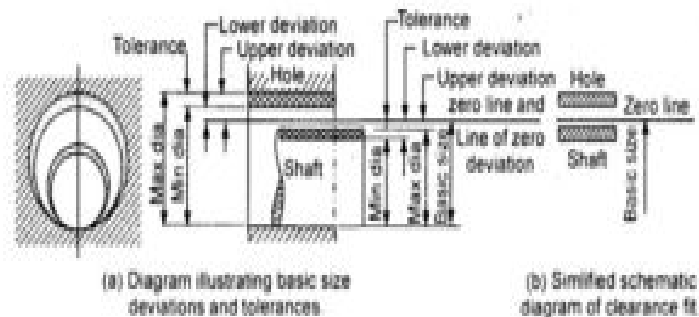
It is the largest permissible size for a dimension, out of the two extreme permissible sizes for a dimension.

Lower Limit

It is the lowest permissible size for a dimension.

Tolerance

This is the difference between the upper limit and the lower limit. This is also the maximum permissible variation in a dimension.



Zero Line

A straight line corresponding to the basic size and the deviations are measured from this line.

Deviation

It is an algebraic difference between a size (actual, maximum) and the corresponding basic size.

Actual Deviation

It is the algebraic difference between actual size and the corresponding basic size.

Upper Deviation

The algebraic difference between actual size and the corresponding basic size.

Lower Deviation

It is the algebraic difference between minimum size and the

corresponding basic size.

Mean Deviation

It is the arithmetical mean of lower and upper deviations.

Fundamental Deviation

This is the deviation, either the upper or the lower deviation, which is the nearest one to the zero line for either a hole or a shaft.

Unilateral and Bilateral Limits

Unilateral limits occur when both maximum limit or minimum limit is either above or below the basic size, but in the case of Bilateral limits maximum limit is above and the minimum limit is below the basic size.

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