

ADVANTAGES & DISADVANTAGES OF VARIOUS THREAD INSPECTION & MEASUREMENT METHODS

THREAD PLUG, RING & CALIPER GAUGES



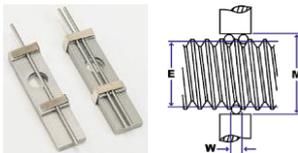
ADVANTAGES

Inspects thread profile and pitch.
Can be used with a minimum of training.
Assuming correct use of Go and No-Go the thread can be judged good or bad.

DISADVANTAGES

Only reveals if the thread is good or bad and not where within the pitch diameter tolerance.
Does not reveal if an external thread major diameter is below tolerance or an internal minor diameter is above tolerance.
Not ideal for machine set-up and not suitable for process control.
Can only be used for the specific thread stated on the gauge.

THREAD WIRES



ADVANTAGES

Very accurate assuming correct calculation and correct flank angle.
Can be used on almost all external threads.
Suitable for machine set-up and process control.
3 "loose" wires are inexpensive.

DISADVANTAGES

Only suitable for external threads.
Requires a calculation to find pitch diameter measurement.
Using 3 "loose" wires requires patience and experience.
Thread wires that clip on to micrometers require suitable micrometers.
N.B. Micrometer spindles come in 3 diameters. 6.35mm/1/4", 8mm / 5/16" and 6.5mm.

THREAD MICROMETERS



ADVANTAGES

Accurate assuming correct flank angle.
Can be used on all threads with same flank angle and pitch.
Suitable for machine set-up and process control.

DISADVANTAGES

Only suitable for external threads.
Thread inserts require special micrometers.
Thread inserts are needed for each thread type and pitch.

OPTICAL THREAD MEASUREMENT



ADVANTAGES

Can measure everything on an external thread.
 Can be used for much more than threads.

DISADVANTAGES

Can only measure external threads.
 Threaded items must be taken out of the machine for measurement.
 Not suitable for large or long threaded items.

FLEXIBLE THREAD MEASUREMENT



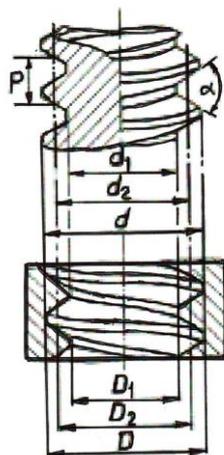
ADVANTAGES

Pitch diameter of both external and internal threads can be measured.
 Thread inserts for all thread types.
 Suitable for machine set-up and process control.
 SPC with suitable digital caliper.

DISADVANTAGES

Thread pitch diameter tolerance should be compatible with caliper accuracy.
 N.B Standard digital caliper accuracy is 0.02mm/0.001" up to 100mm/4".
 A standard M6/UNC 1/4" thread has a pitch diameter tolerance of at least 0.1mm/0.004"

There are of course other thread measurement possibilities but most of these are either expensive or not suitable for normal workshop use. For measuring pitch diameter on mass produced threads then thread roller type gauges can be best but expensive. Probably the best method of ensuring a "perfect" thread is by using a thread Go gauge and also measuring pitch diameter. Measuring an external thread OD (major diameter) and an internal thread ID (minor diameter) is easy and should always be done.



EXTERNAL

d MAJOR DIAMETER
 d2 PITCH DIAMETER
 d1 MINOR DIAMETER

INTERNAL

D MAJOR DIAMETER
 D2 PITCH DIAMETER
 D1 MINOR DIAMETER

P PITCH
 alpha FLANK ANGLE