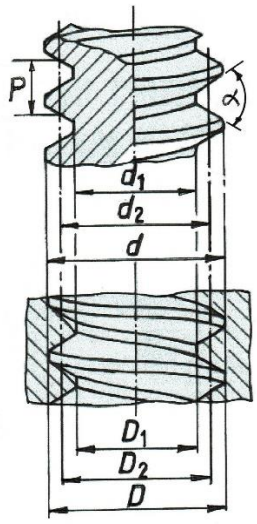
STANDARD THREAD TOLERANCES

Metric threads

To those that do not normally work with metric threads the designation on a specification or drawing would seem to lack information. This however is not the case.

When for example M24 is written on a specification or drawing it in fact gives both pitch and the three diameter tolerances.

M24 could be written (but almost never is) as M24x3 6g/6H. A small letter (e.g. g signifies an external thread tolerance) and a capital letter (e.g. H signifies an internal thread tolerance.)



M24 for an external thread is also M24x3-6g

d is max 23.952 and min 23.577 (0.375)

d2 is max 22.003 and min 21.803 (0.200)

d1 is max 20.704 and min 19.955 (0.749)

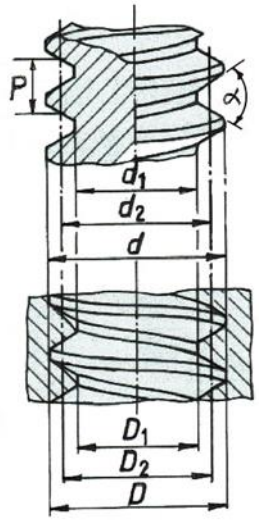
M24 for an internal thread is also M24x3-6H

D is max 24.000 and min 24.698 (0.698)

D2 is max 22.316 and min 22.051 (0.265)

D1 is max 20.752 and min 20.252 (0.500)

The pitch on inch threads is almost always given but, as with metric, 1-8 UNC also gives the three diameter tolerances. The standard tolerance for an external thread (if not specified) is 2A and for an internal thread 2B.



1-8 UNC for an external thread is also 1-8 UNC-2A

d is max 0.9980” and min 0.9830” (0.0150” / 0.381mm)

d2 is max 0.9168” and min 0.9101” (0.0067” / 0.170mm)

d1 is max 0.8627” and min 0.8269” (0.0358” / 0.909mm)

1-8 UNC for an internal thread is also 1-8 UNC-2B

D is max 1.0268” and min 1.0000” (0.0268” / 0.681mm)

D2 is max 0.9276” and min 0.9188 (0.0088” / 0.223mm)

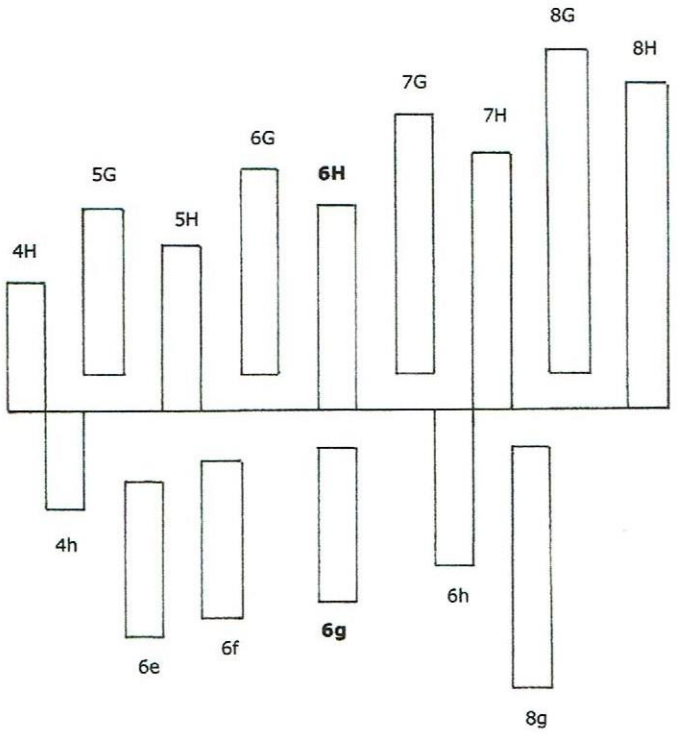
D1 is max 0.890” and min 0.865” (0.0250” / 0.635mm)

For those that work regularly with threads common sense would dictate that the relevant standards for the manufactured threads be purchased. While Machinery Handbooks can be useful they only give a fraction of the information often needed.

Better safe than sorry could not only save money but also reputation. One bad delivery usually gets remembered much longer than many good deliveries. I’ve only once forgotten our wedding anniversary once but it’s a mistake I’ll never make again 😊

Threads have of course other "standard" tolerances than those mentioned on the first page. Pitch diameter tolerances for inch threads are less and seem more logical than those for metric threads as can be seen below.

THREAD PITCH DIAMETER TOLERANCE AREAS



METRIC THREADS

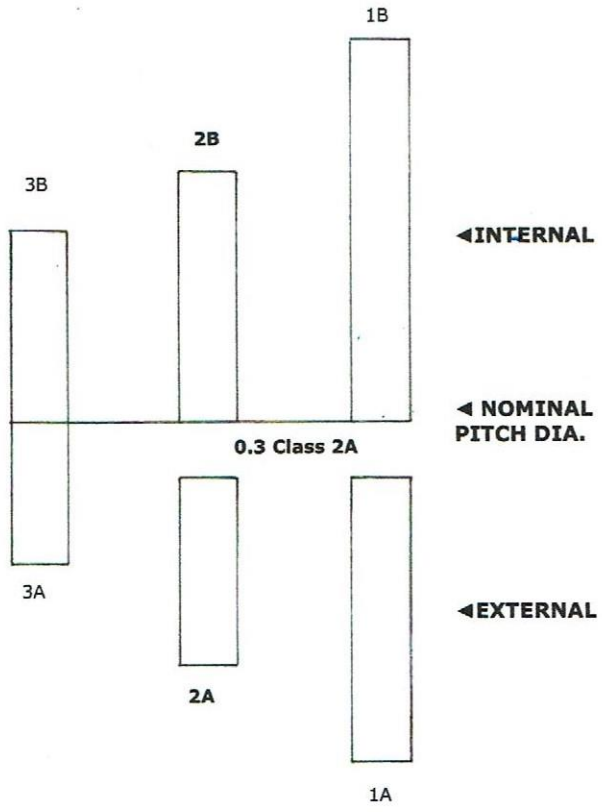
REF.: ISO 965

Internal metric thread are symbolized by a capital letter and external by a small letter.

If no tolerance is given on an internal metric thread then it is 6H and on an external metric thread 6g.

There are a few more tolerance areas than those shown and for complete information it is recommended that the standard ISO 965 be read.

The figure is only to give an indication of tolerance size and the positioning with regard to the nominal pitch diameter



UNIFIED INCH SCREW THREADS

REF.: ASME B1.1

Tolerance Class 2A is the foundation. If this tolerance is know all others are easily calculated.

i.e.

1A = 1.500 X 2A	**1B = 1.950 X 2A**
2A = 1.000 x 2A	**2B = 1.300 x 2A**
3A = 0.750 x 2A	**3B = 0.950 x 2A**

Allowance from the nominal pitch diameter for 2A and 1A is 0.3 times class 2A.

Internal unified thread are symbolized by a capital letter B and external by a capital A.

If no tolerance is given on an internal unified thread then it is 2B and on an external unified thread 2A.

For complete information it is recommended that the standard ASME B1.1 be read.

The figure is only to give an indication of tolerance size and the positioning with regard to the nominal pitch diameter