

METRIC THREAD

PITCH DIAMETER TOLERANCES

from **M3** up to **M180**

Ref. DS 680, DS 681, DS 682, DS 683 & DS 684



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N.B. DS 680, DS 681, DS 682, DS 683 & DS 684 also has tolerances for d / D and d₁ / D₁

*When the tolerance class is not given in the thread denomination, a standard nut is **6H** and a standard screw is **6g***

SCREW THREAD TOLERANCE DENOMINATIONS AND THEIR RELEVANCE FOR METRIC THREADS

Metric threads have the same tolerance build-up as for axles and holes. The number is the tolerance size and the letter is the position of the tolerance to nominal. The number and the letter are also reversed. The number for a thread pitch diameter tolerance gives a significantly larger tolerance than for a similar sized axle or hole. The tolerance is also larger for a nut than for a screw – even with the "same" letter". Nuts (internal threads) have always a capital letter and screws (external threads) always a small letter. A nut with an "H" tolerance has the same min. pitch diameter as a mating screw has with an "h" tolerance has as max. pitch diameter.

If a drawing states **M36x4-6H/6g**, then this means that the nut is to be **M36x4-6H**, and the screw **M36x4-6g**. This means that the nut's minimum pitch diameter size shall equal the nominal pitch diameter, and the screw's pitch diameter size shall be a few hundredths of a millimetre under nominal pitch diameter.

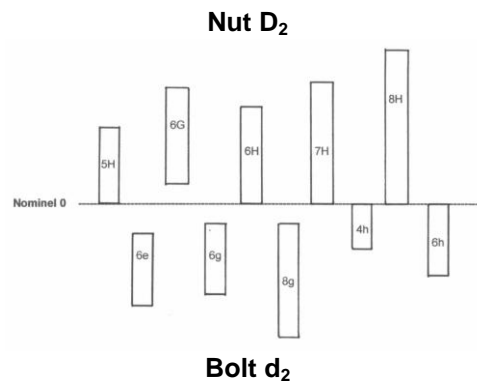
Surface Coating

When a thread is to be surface coated it should be specified (apart from coating thickness) thread pitch diameter tolerances for both before and after surface coating – especially is the machining and surface coating is carried out by two different companies.

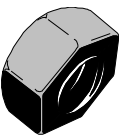

Note that a surface coating of, for example 10µm (0,010mm), on a 60° thread will change the pitch diameter by approximately 40µm (0,040mm) as all four thread flanks will be coated.

M36x4-6H & M36x4-6g

M means **Metric**, **36** is the thread's major diameter (**D/d**), **x4** means a **4 mm pitch**, **6** is the tolerance size and the letter (**H** or **g**) gives the tolerance's position in relation to the nominal pitch diameter. An **H** on a nut tolerance means that the minimum pitch diameter dimension on a nut will be equal to the nominal pitch diameter. An **h** on a screw tolerance means that the maximum pitch diameter dimension on a screw will be equal to the nominal pitch diameter. The letter **g** on a screw means that the largest pitch diameter on a screw will always have clearance to a nut with an **H** tolerance.



The following information is for a standard ISO metric screw thread **M16x2 - 6H/6g** ref. ISO 965-3 and shows the tolerance difference between the three diameters the pitch diameter having the smallest tolerance.

Standard M16x2 NUT (6H) 	D	16,000	Standard M16x2 BOLT (6g) 	d	16,000 - 0,038 - 0,318	Measuring an external thread is usually easier to do than an internal thread. This is probably the reason for internal thread having a larger tolerance than external. Note the pitch diameter tolerance – nut 0,212 and the bolt 0,160 As a thread is usually measured in 0,01mm, it is most practical to round the result to the nearest 0,01mm. If a measurement result is sought to 0,001mm then the flank angle and pitch should also be measured. The actual pitch diameter D₂ for an internal thread should never be less than the nominal pitch diameter. The actual pitch diameter d₂ for an external thread should never be larger than the nominal pitch diameter.
	D₂	14,701 + 0,212 - 0		d₂	14,701 - 0,038 - 0,198	
	D₁	13,835 + 0,375 - 0		d₁	13,546 - 0,038 - 0,327	