

Dimensional Effect of Coating.—On a cylindrical surface, the effect of coating is to change the diameter by twice the coating thickness. On a 60-degree thread, however, since the coating thickness is measured perpendicular to the thread surface while the pitch diameter is measured perpendicular to the thread axis, the effect of a uniformly coated flank on the pitch diameter is to change it by four times the thickness of the coating on the flank.

External Thread with No Allowance for Coating: To determine gaging limits before coating for a uniformly coated thread, decrease: D) maximum pitch diameter by four times maximum coating thickness; E) minimum pitch diameter by four times minimum coating thickness; F) maximum major diameter by two times maximum coating thickness; and G) minimum major diameter by two times minimum coating thickness.

External Thread with Only Nominal or Minimum Thickness Coating: If no coating thickness tolerance is given, it is recommended that a tolerance of plus 50 per cent of the nominal or minimum thickness be assumed.

Then, to determine before coating gaging limits for a uniformly coated thread, decrease:

H) maximum pitch diameter by six times coating thickness; I) minimum pitch diameter by four times coating thickness; J) maximum major diameter by three times coating thickness; and K) minimum major diameter by two times coating thickness.

Adjusted Size Limits: It should be noted that the before coating material limit tolerances are less than the tolerance after coating. This is because the coating tolerance consumes some of the product tolerance. In cases there may be insufficient pitch diameter tolerance available in the before coating condition so that additional adjustments and controls will be necessary.

Strength: On small threads (5 mm and smaller) there is a possibility that coating thickness adjustments will cause base material minimum material conditions which may significantly affect strength of externally threaded parts. Limitations on coating thickness or part redesign may then be necessary.

Internal Threads: Standard internal threads provide no allowance for coating thickness.

To determine before coating, gaging limits for a uniformly coated thread, increase:

L) minimum pitch diameter by four times maximum coating thickness, if specified, or by six times minimum or nominal coating thickness when a tolerance is not specified;

M) maximum pitch diameter by four times minimum or nominal coating thickness;

N) minimum minor diameter by two times maximum coating thickness, if specified, or by three times minimum or nominal coating thickness; and O) maximum minor diameter by two times minimum or nominal coating thickness.

Other Considerations.—It is essential to review all possibilities adequately and consider limitations in the threading and coating production processes before finally deciding on the coating process and the allowance required to accommodate the coating. A no-allowance thread after coating must not transgress the basic profile and is, therefore, subject to acceptance using a basic (tolerance position H/h) size GO thread gage.

Formulas for M Profile Screw Thread Limiting Dimensions.—The limiting dimensions for M profile screw threads are calculated from the following formulas.

Internal Threads: Minmajordia. = basic major dia. + EI (Table 7)

Minpitchdia. = basic major dia. - 0.649519P (Table 3) + EI for D_2 (Table 7)

Maxpitchdia. = min pitch dia. + T_{D2} (Table 8)

Maxmajordia. = max pitch dia. + 0.793857P (Table 3)

Minminordia. = min major dia. - 1.082532P (Table 3)

Maxminordia. = min minor dia. + T_{D1} (Table 9)

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