# Accurate Formula to Compute the Pitch and Major / Minor Diameters for Before Plate Thread Plugs and Thread Rings**

Courtesy Pennoyer Dodge

If no plating tolerance is given, then it is assumed that the maximum plating thickness will be nominal or minimum thickness given plus 50% (see ASME B1.1-1989, pg. 16, 7.4.2; pg. 18, 7.5.2). The diameters of the gaging for external threads will be smaller while the diameters of the gaging for internal threads will be larger, than standard.

Thread Plugs

For the **GO** plug pitch diameter, **add** the MAX amount of plate. For the **NOT GO** pitch diameter, **add** the MIN amount of plate. For the majors of work plugs, **increase** the major diameter on **GO** work plug by using half the MAX amount of plate. On **NOT GO** work plugs, **increase** the major diameter by using half the MIN amount of plate.
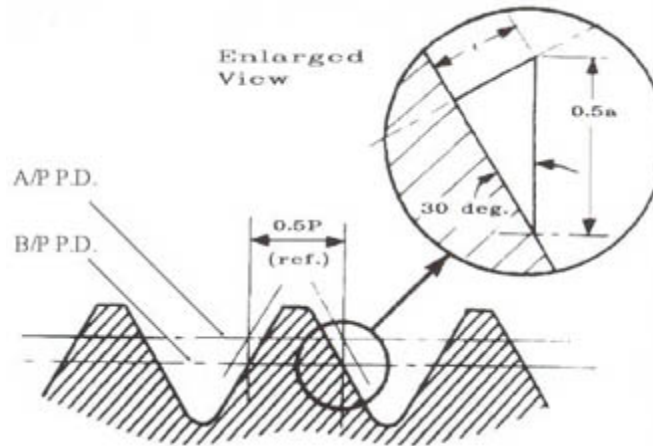
Enlarged View

0.5a

30 deg.

A/P P.D.

B/P P.D.

0.5P (ref.)

Example
Based on .0002 to .0003 allowance per side (multiply by 4)
.0002 X 4 = .0008 MIN
.0003 X 4 = .0012 MAX

1/4 - 28 UNF 2B B / P
Basic GO P.D. .2268 + .0012 MAX = .2280 GO P.D.
Basic NOT GO P.D. .2311 + .0008 MIN = .2319 NOT GO P.D.

Basic GO major .2500 + (.0012 / 2) = .2506 B / P GO major.
Basic NOT GO major .2466 + (.0008 / 2) = .2470 B / P NOT GO major.

Thread Rings

For the **GO** ring, **subtract** the MAX amount of plate.
For the **NOT GO** ring **subtract** the MIN amount of plate.
For the minors of thread rings, **decrease** the minor diameter on the **GO** thread ring by using half the MAX amount of plate.
On the **NOT GO** thread rings, **decrease** the minor diameter by using half the MIN amount of plate.

Example
Based on .0002 to .0003 allowance per side (multiply by 4)
.0002 X 4 = .0008 MIN
.0003 X 4 = .0012 MAX

1/4 - 28 UNF 2A B / P
Basic GO P.D. .2258 - .0012 MAX = .2246 GO P.D.
Basic NOT GO P.D. .2225 - .0008 MIN = .2217 NOT GO P.D.

Basic GO minor .2103 - (.0012 / 2) = .2097 B / P NOT GO minor.

Basic NOT GO minor .2148 - (.0008 / 2) = .2144 B / P NOT GO minor.

Ratio of Pitch Diameter Change to Thickness of Coating (60 deg. Only)

t = thickness of coating
a = pitch diameter change due to coating

0.25a = t and a = 4t or the pitch diameter of a 60 deg. thread changes by four times the thickness of the coating.

Before Plating Ratios

60 deg. thread = 4:1
14 1/2 deg. Acme = 8:1
7 deg.- 45 deg. Buttress = 4.562544066:1
14 1/2 deg - 5 deg. Buttress = 11.9311:1
10 deg. Square thread = 23:1

** In accordance with ANSI / ASME B1.1 - 1989