TAPER PIPE THREAD GAGES

METHOD OF GAGING PRODUCT – NPT

Internal Taper Pipe Threads: The plug gage is screwed up tight by hand into the internal thread of the product. The thread is within the permissible tolerance when the gaging notch of the working plug is not more than plus or minus one turn from being flush with the end of the thread. Fig. 1.

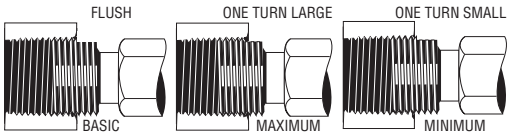

Fig. 1 Gaging internal American National Taper pipe threads with working gage. When the internal thread is chambered, the gaging point shall be the intersection of the chamber and the pitch cone of the thread.

External Taper Pipe Threads: In gaging external taper threads, the ring gage is screwed up tight by hand on the external thread of the product. The thread is within the permissible tolerance when the the gaging face of the working ring is plus or minus one turn from being flush with the end of the thread. Figure 2.

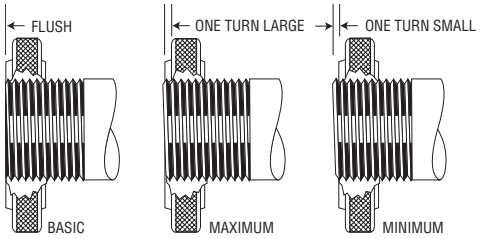

Fig. 2 Gaging external NPT threads.

Limit Type Plug and Ring Gages

The limit type gage is used to eliminate counting turns by which the gage over or under travels to the basic surface.

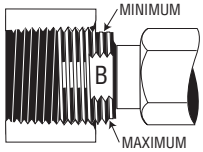

Fig. 3
L^1 limit type Plug Gage

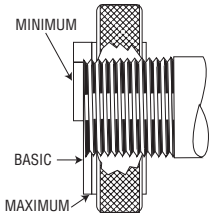

Fig. 4
L^2 limit type Ring Gage

The gages include the basic notch on the plug and the basic surface on the ring and in addition include two notches, or steps, on both plug and ring. One notch is considered the maximum and the other the minimum. The retention of the basic step, or notch, facilitates checking against master and reference gages and provides a means of checking the maximum and minimum steps.

METHOD OF GAGING PRODUCT ANPT AND NPTF

Internal Threads. The internal thread is first gaged with a limit-type L1 taper thread plug gage, and the gaging notch which most nearly represents the size of the thread is noted.

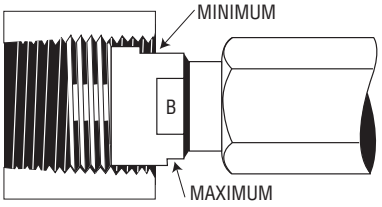

Fig. 5 Checking fitting with L^3 thread Plug Gages.

The three product threads beyond the L1 are called the L3 length and are the additional threads which will be engaged when the pipe is tightened with a wrench, or "wrench tight". These threads are next gaged with an L^3 taper thread plug gage. This is also a limit type gage with the length equal to L^1 plus L3, but which has four threads at the small end only. For a thread to be acceptable on an L3 gage, the position of the gaging notch must coincide within 1/2 turn of the position previously noted on the L1 gage. The L1 and the L3 together check the lead, taper, pitch diameter, and the major diameter.

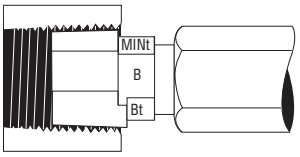

Fig. 6 Checking minor diameter truncation with 6 step plain Plug Gages.

The minor diameter of internal threads is determined by the amount of truncation of the thread crests. As the truncation and pitch diameter varies within limits, so will the minor diameter vary and for this reason it is customary to refer to minor diameter as at "maximum truncation" or "minimum truncation". There are also 3 pitch diameter gaging positions: basic,minimum, and maximum which necessitates 3 pairs of maximum and minimum truncation steps, or a total of 6 positions.

To gage the minor diameter, a 6 step plain plug gage is always used in connection with the L1 gage. The L1 gage is used as a guide to determine the gaging position. If the basic gage notch is flush with end of the product, the threads are considered to be basic. The plain plug gage used on the same fitting should show the end of the product at or between the basic maximum and minimum notches.

External Threads: ANPT and NPTF external threads are first gaged with a thin L1 taper thread ring gage. Observe the small end of the gaging face of the ring to the small end of the pipe.

Fig. 7 L2 Thick Ring Gage