

**Subject:** Desired installation requirements for NPT pump connections.

Use of non-hardening oil pipe dope is recommended on threads of all fittings. Do not loosen or tighten any factory pump plugs that are not used in the installation. Do not use Teflon tape.

**NUMBER OF ROTATIONS:**

Included in the standards for NPT threads and ANPT threads are engagement length, both straight and wrenched. For example, a 1/4 inch tapered pipe fitting should screw in 4.1 threads until finger tight (hand tight engagement), and 3 threads for wrench makeup. One problem is the wide variance in quality of the fittings and threads. Few 1/4 inch fittings screw in 4.1 threads before they reach finger tight. As a general guideline, after hand-tight engagement, tighten 2 full turns for sizes up to 1 inch for NPT thread fittings. You should have between 3.5 and 6 engaged threads. Any number outside of this range may indicate either under or over tightening of the joint or out of tolerance threads.

Recommendation of Torque for Tightening Fittings		
Fitting Thread Size	Torque, lb-ft	Torque, kgf/cm
10-32, M5 -M6	1.0 -1.5	14 -21
NPT1/8, R1/8	5 -6.5	70 -90
NPT1/4, R1/4	8.5 -10	120 -140
NPT3/8, R3/8	16 -17.5	220 -240
NPT1/2, R1/2	20 -21.5	280 -300

Tighten fitting by hand, and then turn it 2 turns with a wrench until it reaches the desire torque listed.

NPT Tapered threads seal (in theory) by interference. Since there are several variables that enter into determining coefficient of friction (material, pipe dope, Teflon tape) and by extension torque, it is not practical to use torque. If you used torque one of the following would occur periodically:

- 1) you would thread a pipe into an oversized fitting or an undersized pipe into a fitting too far and still not get a good seal because the thread form was all wrong where interference is generated.
- 2) You would thread a pipe into an undersized fitting or an oversized pipe into a fitting and not get sufficient engagement for sound mechanical connection.