

The variety of thread forms available under taper threads include:

NPT – American Standard Taper Pipe Thread (ANSI B1.20.1).

NPTF – Dryseal American Standard Taper Pipe Thread (SAE J476, ANSI B1.20.3).

BSPT or JIS “PT” – British Standard Pipe, Tapered (BS21, JIS B 0203, ISO 7), also known as “R” for male and “Rc” for female.

M-Keg – Metric taper threads (DIN 158).

The vast majority of Parker Tube Fittings Division’s standard pipe thread fittings are machined with the NPTF thread form. NPTF thread is also referred to as Dryseal Pipe Thread.

The full thread profile contact of NPTF threads is designed to give the tapered threads self-sealing ability without thread sealant. However, variations in condition of mating threads, fitting and port materials, assembly procedures and operating conditions make self-sealing highly improbable. Some type of thread sealant is, therefore, required to achieve proper seal and, in some cases, additional lubricity to prevent galling.

Types of Sealant/Lubricant

Sealant/Lubricants assist in sealing and provide lubrication during assembly, reducing the potential for galling. Pipe thread sealants are available in various forms such as dry pre-applied, tape, paste and anaerobic liquid.

Pre-applied sealants, such as “Vibraseal” (registered trade-mark of Loctite Corporation) and powdered PTFE are usually applied to connectors by the manufacturer. Connectors with some of these sealants may be remade a few times without needing additional sealant. Vibraseal may also help reduce loosening due to vibration.

PTFE tape, if not applied properly, can contribute to system contamination during assembly and installation. In addition, because of PTFE’s high lubricity, fittings can be more easily over tightened; and it does not offer much resistance to loosening due to vibration.

Paste sealants can also contribute to system contamination, if not applied properly. They are also messy to work with; and some types require a cure period after component installation, prior to system start up.

Anaerobic liquids are available from several manufacturers and perform sealing as well as thread locking functions. They are applied to the connectors by the user and require a cure period prior to system start up. Some are soluble in common hydraulic fluids and will not contaminate the system. For proper performance they need to be applied to clean and dry components, carefully following the manufacturer’s directions.

Tapered Thread Port Assembly

The proper method of assembling tapered threaded connectors is to assemble them finger tight and then wrench tighten further to the specified number of turns from finger tight (T.F.F.T.) given in Table T5. The following assembly procedure is recommended to minimize the risk of leakage and/or damage to components.

1. Inspect components to ensure that male and female port threads and sealing surfaces are free of burrs, nicks and scratches, or any foreign material.
2. Apply sealant/lubricant to male pipe threads if not pre-applied. For stainless steel fittings, the use of Parker Thread-mate sealant/lubricant is strongly recommended. (Pre-applied dry sealants are preferred over other sealants). With any sealant, the first one to two threads should be left uncovered to avoid system contamination. If PTFE tape is used it should be wrapped 1-1/2 to 2 turns in clockwise direction when viewed from the pipe thread end.
Caution: More than two turns of tape may cause distortion or cracking of the port.
3. Screw the connector into the port to the finger tight position.
4. Wrench tighten the connector to the appropriate T.F.F.T. values shown in Table T5, making sure that the tube end of a shaped connector is aligned to receive the incoming tube or hose assembly. **Never back off (loosen) pipe threaded connectors to achieve alignment.**
5. If leakage persists after following the above steps, check for damaged threads and total number of threads engaged.

If threads on the fitting are badly nicked or galled, replace the fitting. If port threads are damaged, re-tap, if possible, or replace the component. If the port is cracked, replace the component.

Normally, the total number of tapered threads engaged should be between 3-1/2 and 6. Any number outside of this range may indicate either under or over tightening of the joint or out of tolerance threads. If the joint is under tightened, tighten it further but no more than one full turn. If it is over tightened, check both threads, and replace the part which has out-of-tolerance threads.

As a general rule, pipe fittings with tapered threads should not be assembled to a specific torque because the torque required for a reliable joint varies with thread quality, port and fitting materials, sealant used, and other factors. Where many of these factors are well-controlled, such as particular jobs on an assembly floor, a torque range that produces the desired results may be determined by test and used in lieu of turns count for proper joint assembly.

Tapered Pipe Thread Size		T.F.F.T.
BSPT	NPTF	
1/8-28	1/8-27	2 - 3
1/4-19	1/4-18	2 - 3
3/8-19	3/8-18	2 - 3
1/2-14	1/2-14	2 - 3
3/4-14	3/4-14	2 - 3
1-11	1-11 1/2	1.5 - 2.5
1 1/4-11	1 1/4-11 1/2	1.5 - 2.5
1 1/2-11	1 1/2-11 1/2	1.5 - 2.5
2-11	2-11 1/2	1.5 - 2.5

Table T5 – Assembly Turns From Finger Tight (T.F.F.T) Values For Steel, Stainless Steel and Brass Pipe Fittings

Dimensions and pressures for reference only, subject to change.