



FLEXIAL QUALITY PROCEDURE

QP158

Change History: See DCN for Details	Rev	Change Date	DCN Number
Initial Release	A	06/13/03	DCN02801
Current Revision	B	7/15/15	DCN13098

Procedure Owner: Production Manager

PROCESS CONTROL - THREADS

1. PURPOSE
 - 1.1. The purpose of this procedure is to define the control method for thread inspection to ensure that product meets design requirements.
2. SCOPE
 - 2.1. This procedure applies to manufactured and procured components and tooling with internal or external threads.
3. GENERAL
 - 3.1. The drawing and/or PO will call-out the requirements for this process as “QP158 – THREAD INSPECTION”
 - 3.2. All inspection authorities shall be responsible for the inspection and approval of thread configurations per this specification, engineering drawing and / or purchase order.
 - 3.3. All threads, internal or external, shall be machined using standard, industry accepted methods and tools.
4. INSPECTION PROCEDURE
 - 4.1. All threads and thread gages should be cleaned thoroughly before inspection.
 - 4.2. Visually inspect for contamination and burrs.
 - 4.2.1. Threads should be free of burrs and rough edges.
 - 4.2.2. Threads shall be free from visible tears, cuts, grinds, shoulders, or other imperfection which break the continuity of the threads within the length of full crest threads.
 - 4.2.3. Threads shall be physically measured to ensure the major diameter is within the specified tolerance.
 - 4.3. All threads must be inspected using the specified NIST traceable and calibrated thread ring or plug gages sets, using both GO and NO GO gages. Certifications of calibration and traceability must be available and provided upon request. Note: Certification frequency must be established based on the use of the gage and its potential for wear. Some uses may require recalibration after as few as 50 or 100 uses.
 - 4.4. GO GAGE
 - 4.4.1. The use of the go-gage must allow for free acceptance, meaning minimal force (torque) is required to install and thread the gage throughout the entire length of specified thread area. In general, the ring gage should spin freely without evident drag. When the go gage spins freely, torque inspection is not required. However, in case of concern over tight fit, where the Go gage does not spin freely, the following table shall quantify the acceptable ranges. The maximum allowable inspection

torque value for using all thread ring and plug gages is :

THREAD SIZE	IN-LBS MAX
Up to 1/4, M6	0.5 IN-LB
Up to 3/8, M10	0.75 IN-LB
Up to 1/2, M12	1.0 IN-LB
Up to 3/4, M20	1.5 IN-LB
Over 3/4, M20	2.0 IN-LB

4.5. NO GO GAGE

- 4.5.1. The No Go gage should not be accepted for more than two (2) complete turns.
- 4.6. Thread Depth \ Length Measurement – actual depth or length measurement should be taken using the ring or plug gage as appropriate. Measure the actual travel using the GO set as shown in diagram A.

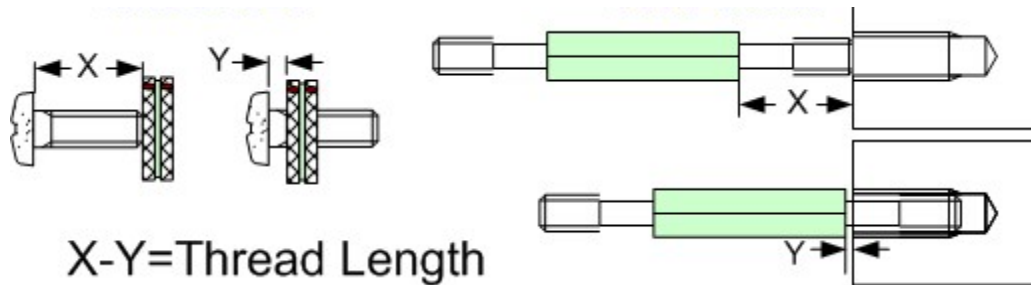


DIAGRAM A

- 4.7. Threaded features should be inspected 100% during manufacture. Threads should be protected through proper packaging and handling methods to ensure threads are not damaged in subsequent handling or processing.

5. EXCEPTIONS

- 5.1. All exceptions must be approved by Flexial Engineering prior to shipment or further processing.

6. REFERENCES – The applicable requirements in this procedure have been reviewed and determined to meet or exceed the industry standard requirements, for reference the following documents were reviewed: ISO 6157-3, DIN 276, Part 19, EN26157-3, Ford WA-990, ASME B1.1, B1.2 (Inch Threads), ASME B1.13, B1.16M (Metric Threads), ISO 68, 261, 965/1, 965/2, 1502 (Metric Threads), JIS B 0209, 0251 and 0211, 0252 (Metric Threads).