

Locking Fastener Conformance to NASM25027

Scope National Aerospace Standard NASM25027 provides specifications for self-locking nuts that include performance requirements for locking torque, torque-out, push-out, resistance to vibration and others. Pencom NAL self-clinching, self-locking floating nuts meet the applicable section which includes quality conformance inspection requirements for locking torque at ambient room temperature.

Requirements The specification requires conformance with two torque performance measures during a 15-cycle reusability test: maximum locking torque during installation or removal, and minimum breakaway torque, **Table 1**. The NASM25027 specification only provides requirements for inch-series threads – not metric. Metric thread torque values are based on equivalent inch thread values.

Test Procedure The NASM25027 specification provides detailed guidelines on how the torque tests shall be performed and can be summarized as follows. A screw having clean and dry 3A threads shall be installed onto a nut. Since the specification does not address metric threads, Pencom uses a comparable thread fit of 4h. A new screw, having similar material as that of the nut, shall be used for each test.

The screw is installed and removed for 15 cycles with the maximum installation and removal torques measured during the first, seventh and fifteenth cycles. Each cycle consists of engaging the screw until one to two full screw threads extend beyond the nut locking element. While performing the maximum torque test, the minimum breakaway torque is also measured during the first, seventh and fifteenth cycles.

The locking torque tests shall be conducted with no axial load applied on the nut at a rate such that the nut temperature does not exceed 75°F greater than ambient room temperature.

Guidelines for Use Pencom NAL self-locking, self-clinching floating nuts are supplied with a molybdenum disulfide-based dry-film lubricant to meet the requirements of NASM25027. Any additional lubricants, coatings or treatments applied to the nuts or mating fasteners will alter the torque performance.

Table 1

Thread Size	Maximum Locking Torque	Minimum Breakaway Torque
Inch (in-lbs)¹		
2-56	2.5	0.2
4-40	5.0	0.5
6-32	10.0	1.0
8-32	15.0	1.5
10-24	18.0	2.0
10-32	18.0	2.0
1/4-20	30.0	4.5
1/4-28	30.0	3.5
Metric (N-m)		
M3	0.56	0.056
M3.5	1.13	0.113
M4	1.70	0.170
M5	2.03	0.220
M6	3.20	0.370

(1) Torques for inch-series threads derived from NASM25027 Table III.