GM WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW3362

M Point for External Metric Thread, Coarse Pitch Fasteners

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard specifies the characteristics of M Points for external metric threaded fasteners with coarse pitch; M4, M5, M6, M8, M10, M12, M14, M16, M18 and M20.

1.1.1 Designation.

Type A: Bolts, screws, studs and double end studs with a standard end point, see Figure 1 and Table 1.

Type B: Bolts, screws and double end studs with an external hex driver end point, see Figure 2 and Table 2.

Type C: Bolts, screws and double end studs with an external six-lobe driver end point, see Figure 3 and Table 3.

Note: When not explicitly specified, the default shall be Type A.

1.2 Applicability. This specification applies to the design of an anti-cross threading feature for externally threaded fasteners.

Note: Only the latest approved standards are applicable unless otherwise specified.

1.3 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References. None.

3 Requirements

3.1 Dimensions. All dimensions in this standard are given in millimeters (mm) unless otherwise stated.

3.1.1 Length. For fasteners of Nominal Thread Length (Lnom) ≤ 50 mm, the tolerance, T, shall be ± 0.15 mm. For fasteners of Nominal Thread Length (Lnom) > 50 mm, the tolerance, T, shall be ± 0.25 mm. The nominal length is calculated from the required full thread length or the maximum overall length required of the fastener for the joint. The nominal length is the distance parallel to the fastener axis from the bearing surface or datum surface (example: end of the shoulder on a shoulder bolt) to the lead thread where the thread profile approximates 0.20x the thread pitch in height (measured from the thread root).

3.1.2 M Point Thread. The M Point thread length, U, is a reference dimension used for calculation purposes. The profile of all lead threads shall not exceed maximum material condition boundaries of the standard thread. At least one (1) complete turn (360 degrees) of the first two (2) threads shall be smoothly and uniformly curved for its entire profile with no localized scallops, fissures, underfill, flats or other discontinuities permitted at the crest of the thread. A thread specific **GO** screw ring gauge shall pass freely over first four (4) threads after coating.

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3.1.3 Dog Point. The dog point length, Z_3, is a minimum length for the dog point cylinder. The length of the dog point cylinder shall be measured from the point on the lead thread where the lead thread approximates 0.20x the thread pitch in height (measured from the thread root) to the point on the cylinder where the end radius is tangent. The diameter of the dog point cylinder, D_x, shall be larger than D_x minimum when measured at the tangent point. Dog point cylinder diameter D_x shall be held for entire dog point length Z_3 with no taper allowed.

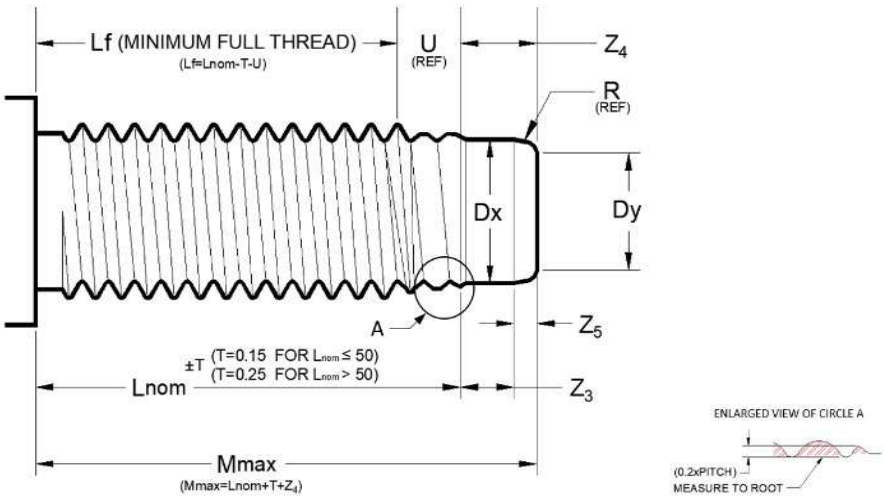
3.1.4 Radius Point. The radius point length, Z_5, is a minimum length for the point beyond the dog point. The radius of this point, R, is a reference dimension only, and its shape may not be a true radius. The end of the point shall be reasonably square with the thread axis, and the edge may be irregular. The tip diameter, D_y, is a maximum for the radius point.

3.1.5 Point Length. The overall point length, Z_4, is a maximum length. It represents the sum of the dog point length and the radius point length.

3.1.6 Minimum Full Thread Length. The minimum full thread length, Lf, is measured from the bearing surface or datum surface to a point where the last full thread is equal to the major diameter minimum tolerance limit. The minimum full thread can be derived by calculation or specified depending on the fastener requirements.

3.1.7 Maximum Overall Length. The maximum overall (built-in) length, Mmax, is the sum of the maximum nominal length (maximum) and the maximum overall point length (Z_4 maximum). It is the maximum distance from the bearing surface to the end of the fastener, (Mmax).

Figure 1: Dimension Illustration for Type A



Note: REF = Reference.

Table 1: Dimensions for Type A

Thread		M4	M5	M6	M8	M10	M12	M14	M16	M18	M20
D_x	maximum	3.170	4.030	4.800	6.540	8.230	9.950	11.720	13.720	15.172	17.172
	minimum	3.098	3.954	4.724	6.447	8.143	9.880	11.604	13.609	15.057	17.057
D_y	maximum	2.70	3.40	4.00	5.50	6.80	8.20	9.60	10.90	12.20	13.30
R	reference	1.2	1.5	1.8	2.3	2.8	3.3	4.1	4.7	5.2	6.0
U	reference	1.5	1.8	2.3	2.8	3.4	4.0	4.5	4.5	5.6	5.6
Z_3	minimum	1.20	1.30	1.50	2.10	2.60	3.15	3.68	4.10	4.40	4.65
Z_4	maximum	2.40	2.50	2.85	3.90	4.65	5.65	6.43	7.10	8.50	8.80
Z_5	minimum	0.50	0.60	0.75	1.00	1.25	1.50	1.75	2.00	2.90	3.21

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