

1. Scope

This Material Standard covers the requirements for inch-based, zinc-coated, hex head, steel machine bolts, each assembled with one hex nut.

2. Application

The machine bolts and nuts covered by this Material Standard will be used primarily in above ground electrical utility facility construction and where the applied load is primarily a tensile load.



3. Material ID Numbers

This Material Standard applies to the District Material ID Numbers listed in Table 1 on page 3 of this document.

4. Reference Standards

Unless otherwise stated in this Material Standard, the machine bolts and nuts covered by this Material Standard shall comply with the latest revisions of the following industry standards:

- IEEE C135.1 Standard for Zinc-Coated Steel Bolts and Nuts for Overhead Line Construction
- ASME B18.2.1 Square and Hex Bolts and Screws (Inch Series)
- ASTM A153 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware

5. Common Requirements

5.1 Bolts

- a. Material - Bolts shall be made from steel in accordance with IEEE C135.1, Section 3.1.
- b. Dimensions - Bolts shall be dimensioned in accordance with IEEE C135.1, Tables 2, 6 and 7. Thread lengths shall be as specified in Table 1 on page 3 of this Material Standard.
- c. Threads - Bolt threads shall be machine-rolled; cut threads are not acceptable. This requirement is a clarification to IEEE C135.1, Section 5.1. Each bolt of the following nominal size shall have the following number of threads per inch in accordance with IEEE C135.1, Table 7:

Nominal Bolt Size	Number of Threads per Inch
1/2"	13
5/8"	11

- d. Corrosion Protection - Zinc coated by the hot-dip process in accordance with ASTM A153.

5.2 Nuts

- a. a) Material - Nuts shall be made from steel in accordance with IEEE C135.1, Section 3.2.
- b. b) Dimensions - Nuts shall be dimensioned in accordance with IEEE C135.1, Tables 5 and 8.
- c. c) Threads - After zinc coating, nut threads shall be tapped oversize in accordance with IEEE C135.1, Table 8. Each nut of the following nominal size shall have the following number of threads per inch:

Nominal Bolt Size	Number of Threads per Inch
1/2"	13
5/8"	11

- d. Corrosion Protection - Zinc coated by the hot-dip process in accordance with ASTM A153.

6. Tensile Strength

Machine bolts shall have the following minimum tensile strength ratings in accordance with IEEE C135.1, Table 10:

Nominal Bolt Size	Minimum Tensile Strength (lbf)
1/2"	7,800
5/8"	12,400

7. Packaging

7.1 Quantity

Standard package quantity shall conform to the requirements specified in Table 1 on page 3 of this Material Standard.

7.2 Weight

Package weight shall not exceed 50 lb

7.3 Package Marking

Each package shall be legibly marked with the following information:

- a. Manufacturer's identification
- b. Machine bolt size x length
- c. Quantity of bolts contained

8. Shipping

Product shall be shipped to the address specified on the Purchase Order.

9. Inspection

The District reserves the right to inspect all products upon receipt. Bolts and nuts not conforming to this Material Standard, or damaged, will be rejected and returned at the Supplier's expense. Acceptance of delivery does not relieve the Supplier from meeting all of the requirements of this Material Standard.

Table 1

Detailed Requirements for Hex Head Machine Bolts

Cat. ID	Nominal Size X Length	Min. Thread Length	Standard Quantity Per Package
102187	1/2" x 1"	Full	50
102195	1/2" x 1-1/4"	Full	50
102236	1/2" x 1-1/2"	1-1/4"	50
102244	1/2" x 1-3/4"	1-1/4"	50
102252	1/2" x 2"	1-1/4"	50
102260	1/2" x 2-1/4"	1-1/4"	50
102278	1/2" x 2-1/2"	1-1/4"	50
102286	1/2" x 2-3/4"	1-1/4"	50
102294	1/2" x 3"	1-1/4"	50
102301	1/2" x 3-1/2"	1-1/4"	50
102319	1/2" x 4"	1-1/4"	50
102327	1/2" x 4-1/2"	1-1/4"	50
1002259	5/8" x 1"	Full	50
102335	5/8" x 1-1/4"	Full	50
102343	5/8" x 1-1/2"	Full	50
102351	5/8" x 1-3/4"	1-1/2"	50
102369	5/8" x 2"	1-1/2"	50
102377	5/8" x 2-1/4"	1-1/2"	50
102385	5/8" x 2-1/2"	1-1/2"	50
102393	5/8" x 3"	1-1/2"	50
102400	5/8" x 3-1/4"	1-1/2"	50
102418	5/8" x 4"	3"	50
102426	5/8" x 4-1/2"	3"	50
1000995	5/8" x 7"	3"	50