
BOLTS USED IN WOOD CONSTRUCTION

Disciplines: Structural**History:** Revised 05/13/20

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PURPOSE

This interpretation of Regulations (IR) clarifies dimensional requirements for bolts used in wood frame construction for projects under DSA jurisdiction.

SCOPE

This IR is applicable to the specification and acceptance of steel bolts used in wood construction.

BACKGROUND

Dimensional requirements for bolts are given in America Society of Mechanical Engineers (ASME) B18.2.1, "Square, Hex, Heavy Hex and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)", and ASME B18.2.6, "Fasteners for Use in Structural Applications." Bolt threads are formed either by cutting or rolling.

1. GENERAL

Cut-thread or rolled-thread bolts with full diameter bodies meeting the requirements of ASME B18.2.1 or ASME B18.2.6 are permitted for use on projects approved by DSA. See Table 1 below for dimensional requirements of cut-thread or rolled-thread bolts with full diameter bodies. Rolled-thread bolts with reduced diameter bodies per ASME B18.2.1 are not permitted.

2. BOLT TYPES

Commercially the terms "cut-thread" and "rolled-thread" may not indicate the method of forming threads. The term "cut-thread bolt" may refer to either a cut-thread bolt or a full diameter body rolled-thread bolt. The term "rolled-thread bolt" may refer to a reduced diameter body rolled-thread bolt.

2.1 Cut-Thread Bolts

The original blank must be full size, and equal to the major thread (outside) diameter. Threads are formed by cutting and removing metal from the blank. A bolt blank is a headed rod or bar intended for a subsequent threading operation.

2.2 Full Diameter Body Rolled-Thread Bolts

The blank diameter is full size and the threaded length portion is reduced to the thread pitch diameter during extrusion. Threads are formed by rotating dies that displace the metal.

2.3 Reduced Diameter Body Rolled-Thread Bolts

Similar to full diameter body rolled-thread bolts, except that the blank diameter is reduced along the entire length of the bolt.

3. APPLICATION

Cut-thread or rolled-thread bolts with full diameter bodies are permitted. For each nominal bolt size utilized on a project, the minimum shank or body diameter shall be specified and ASME B18.2.1 or ASME B18.2.6 shall be referenced in the drawings or specifications.

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| Table 1: Diameter of Full Diameter Body Bolts | | | |
|--|--------|--|-------------|
| Nominal Size (inches) | | Body or Shank Diameter (inches) | |
| | | Max. | Min. |
| 1/2 | 0.5000 | 0.515 | 0.482 |
| 5/8 | 0.6250 | 0.642 | 0.605 |
| 3/4 | 0.7500 | 0.768 | 0.729 |
| 7/8 | 0.8750 | 0.895 | 0.852 |
| 1 | 1.0000 | 1.022 | 0.976 |

Notes:

- 1) Adopted from ASME B18.2.1 and ASME B18.2.6.
- 2) For bolt diameters not indicated, refer to ASME B18.2.1 and ASME B18.2.6.
- 3) The body or shank of a bolt is the smooth portion between the head and the threads.

REFERENCES

California Code of Regulations (CCR) Title 24
Part 2, California Building Code, Chapter 23

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