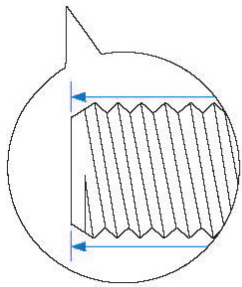
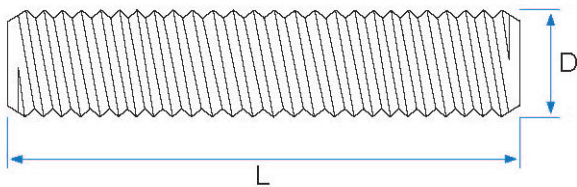


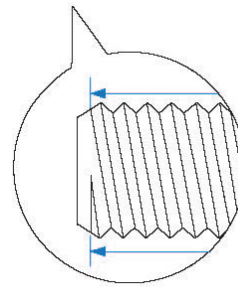
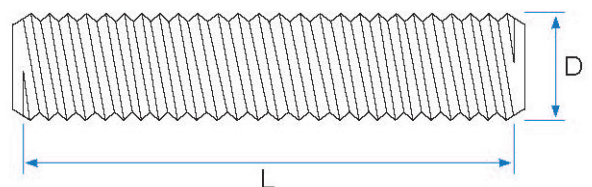
Bolt Length MEASUREMENTS

END-TO-END STUDS



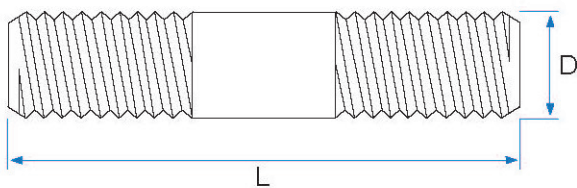
End-To-End or ETE.
The length of stud, measured parallel to the axis, is the distance from extreme end to extreme end.

FIRST-TO-FIRST STUDS



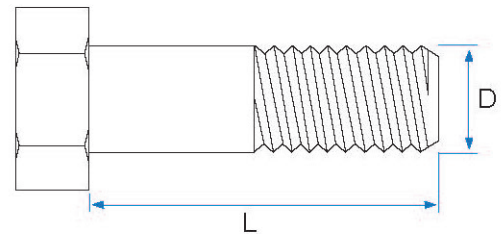
First-To-First or FTF.
The length of stud bolt, measured parallel to the axis, is the distance from first thread to first thread. First thread is defined as the intersection of the major diameter of the thread with the base of the point.

TAP END STUD BOLTS



Length is measured End-To-End or ETE.

HEAVY HEX BOLTS



The length is measured from the bearing surface of the head to the extreme end of the point in a line parallel to the axis of the bolt.