

## Notes of Para. in ASME B18.2.6-2019

Notes for: <https://www.theworldmaterial.com/astm-a325-bolts/>

### Alloying Elements “A” in Chemical Requirements Table

When the maximum value of a given alloying element content range exceeds one or more of the following limits, it shall be regarded as an alloy defined by the American Iron and Steel Institute: 1.65% of manganese; 0.60% of silicon; 0.60% of copper, or the defined range or minimum amount of any of the following elements is specified or required within the recognized field of construction alloy steel:

Aluminum, chromium up to 3.99%, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium or any other alloying element added to obtain the desired alloy effect.

### Para 2.1.5: True Position of Head.

The head shall be located at true position with respect to the body within a tolerance zone having a diameter equivalent to 6% of the maximum width across flats at maximum material condition (MMC). For measurement purposes, hold the body a distance under the head equal to one diameter.

### 2.1.6 Bearing Surface.

Bearing surface shall be flat and washer faced. However, a die seam across the bearing face shall be permissible. Diameter of washer face shall be equal to the maximum width across flats within a tolerance of -10%.

Thickness of the washer face shall be not less than 0.015 inch nor greater than 0.025 inch for bolt sizes 3/4 inch and smaller, and not less than 0.015 inch nor greater than 0.035 inch for sizes larger than 3/4 in.

The plane of the bearing surface shall be perpendicular to the axis of the body within the full indicator movement (FIM) limits specified for total runout. Measurement of FIM shall extend as close to the periphery of the bearing surface as possible while the bolt is being held in a collet or other gripping device at a distance of one bolt diameter from the underside of the head. The angularity measurement shall be taken at a location to avoid interference from a die seam.

### 2.1.10 Point.

Point shall be chamfered or rounded at the manufacturer's option from approximately 0.016 inch below the minor diameter of the thread. The first full formed thread at major diameter is located a distance no greater than 2 times the pitch measured from the end of the bolt. This distance is to be determined by measuring how far the point enters into a cylindrical NOT GO major diameter ring gage (reference gage, see ASME B1.2).

### 2.1.11 Straightness.

Shanks of bolts shall be straight within the following limits at MMC:

(a) For bolts with nominal lengths to and including 12 in., the maximum camber shall be 0.006 in. per

inch (0.006L) of bolt length.

(b) For bolts with nominal lengths over 12 in. to and including 24 in., the maximum camber shall be 0.008 in. per inch (0.008L) of length.

A suggested gage and gaging procedure for checking bolt straightness is given in ASME B18.2.9.

### **3.1.3 Tops and Bearing Surfaces.**

Nuts may be double chamfered or have a washer faced bearing surface and chamfered top.

The diameter of chamfer circle on double-chamfered nuts and diameter of washer face shall be within the limits of the maximum width across flats and 95% of the minimum width across flats.

The tops of washer faced nuts shall be flat and the diameter of chamfer circle shall be equal to the maximum width across flats within a tolerance of -15%. The length of chamfer at hex corners shall be 5% to 15% of the basic thread diameter. The surface of chamfer may be slightly convex or rounded.

Bearing surfaces shall be flat and, unless otherwise specified, shall be perpendicular to the axis of the threaded hole within the total runout (FIM) tabulated for the respective nut size, type, and strength level.

### **3.1.5 Position of Hexagon to Tapped Hole.**

At maximum material condition, the nut body shall be located at true position with respect to the thread pitch diameter within a tolerance zone having a diameter equivalent to 4% of the maximum width across flats for 1 1/2 in. nominal size nuts or smaller.

### **4.1.2 Tolerances.**

Washer inside diameter, outside diameter, thickness, and edge distance shall be in accordance with Table 4.1.1-1. The deviation from flatness shall not exceed 0.010 in. per inch as the maximum deviation from a straight edge placed on the cut side. Circular run out of the outside diameter with respect to the hole shall not exceed 0.030 FIM. Burrs shall not project above immediately adjacent washer surface by more than 0.010 in.

### **4.2.2 Tolerances.**

Tolerances for inside diameter for beveled washers shall be in accordance with Table 4.2.1-1. The flatness shall not exceed 0.010 in. as the maximum deviation from a straight edge placed on the cut side. Burrs shall not project above immediately adjacent washer surface by more than 0.010 in. for smaller than 1 in. and 0.015 in. for 1 in to 1 1/2 in. The slope or taper in thickness shall be 0.98:6 to 1.02:6.

## **6.2 True Position of Head**

The head shall be located at true position with respect to the body within a tolerance zone having a diameter equivalent to 6% of the maximum width across flats at maximum material condition. For measurement purposes, hold the body a distance under the head equal to one diameter.

## **6.3 Bearing Surface**

The hex head washer face diameter shall be equal to the maximum width across flats within a tolerance of -10% and have a thickness not less than 0.015 in. nor greater than 0.025 in. for bolt sizes 3/4 in. and smaller, and not less than 0.015 in. nor greater than 0.035 in. for sizes larger than 3/4 in.

The plane of the bearing surface shall be flat and perpendicular to the axis of the body within the FIM limits specified for total runout. Measurement of FIM shall extend as close to the periphery of the bearing surface as possible while the bolt is being held in a collet or other gripping device at a distance of one bolt diameter from the underside of the head.

A die seam across the bearing surface is not permissible.