

# ASTM A193

ASTM A193 / A194 is the standard specification for alloy-steel and stainless steel bolts used in high-temperature or high-pressure environments or other special-purpose applications. ASTM A194 is the standard specification for carbon and alloy steel nuts for bolts used in equivalent high-pressure or high-temperature environments. ASTM A193 and A194 bolts and nuts from Steel Tubes India are available in a range of grades, including B7, B16 B8 and B8M to meet different design, service conditions, mechanical properties, and high temperature requirements. ASTM A194 also covers the American Association State Highway and Transportation Officials Standard AASHTO M-292.

These bolts and nuts are designed, manufactured and tested to comply with the standards set by ASTM A193 and A194 for chemical composition, tensile and hardness properties and high temperature characteristics.

|               |                    |  |
|---------------|--------------------|--|
| <b>Grades</b> | <b>B7</b>          | Alloy steel, AISI 4140/4142 quenched and tempered                    |
|               | <b>B8 Class 1</b>  | Stainless steel, AISI 304, carbide solution treated                  |
|               | <b>B8M Class 1</b> | Stainless steel, AISI 316, carbide solution treated                  |
|               | <b>B8 Class 2</b>  | Stainless steel, AISI 304, carbide solution treated, strain hardened |
|               | <b>B8M Class 2</b> | Stainless steel, AISI 316, carbide solution treated, strain hardened |

| <b>Mechanical Properties</b> | Grade              | Markings     | Size           | Tensile ksi, min | Yield, ksi, min | Elong, %, min | RA, %, min | Hardness Max |
|------------------------------|--------------------|--------------|----------------|------------------|-----------------|---------------|------------|--------------|
|                              | <b>B7</b>          | <b>B7</b>    | Up to 2-1/2    | 125              | 105             | 16            | 50         | C35          |
|                              |                    |              | 2-5/8 to 4     | 115              | 95              | 16            | 50         | C35          |
|                              |                    |              | 4-1/8 to 7     | 100              | 75              | 18            | 50         | C35          |
|                              | <b>B8 Class 1</b>  | <b>B8</b>    | All            | 75               | 30              | 30            | 50         | B96          |
|                              | <b>B8M Class 1</b> | <b>B8M</b>   | All            | 75               | 30              | 30            | 50         | B96          |
|                              | <b>B8 Class 2</b>  | <b>B8SH</b>  | Up to 3/4      | 125              | 100             | 12            | 35         | C35          |
|                              |                    |              | 7/8 to 1       | 115              | 80              | 15            | 35         | C35          |
|                              |                    |              | 1-1/8 to 1-1/4 | 105              | 65              | 20            | 35         | C35          |
|                              |                    |              | 1-3/8 to 1-1/2 | 100              | 50              | 28            | 45         | C35          |
|                              | <b>B8M Class 2</b> | <b>B8MSH</b> | Up to 3/4      | 110              | 95              | 15            | 45         | C35          |
|                              |                    |              | 7/8 to 1       | 100              | 80              | 20            | 45         | C35          |
|                              |                    |              | 1-1/8 to 1-1/4 | 95               | 65              | 25            | 45         | C35          |
| 1-3/8 to 1-1/2               |                    |              | 90             | 50               | 30              | 45            | C35        |              |

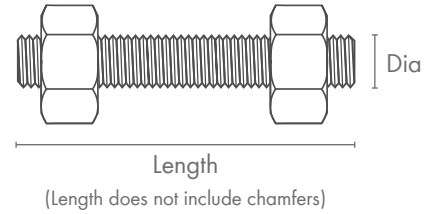
| <b>Chemical Properties</b> | Element         | B7 (AISI 4140) | B8 (AISI 304) | B8M (AISI 316) |
|----------------------------|-----------------|----------------|---------------|----------------|
|                            | Carbon          | 0.37 - 0.49    | 0.08 max      | 0.08 max       |
|                            | Manganese       | 0.65 - 1.10    | 2.00 max      | 2.00 max       |
|                            | Phosphorus, max | 0.035          | 0.045         | 0.045          |
|                            | Sulfur, max     | 0.04           | 0.03          | 0.03           |
|                            | Silicon         | 0.15 - 0.35    | 1.00 max      | 1.00 max       |
|                            | Chromium        | 0.75 - 1.20    | 18.0 - 20.0   | 16.0 - 18.0    |
|                            | Nickel          |                | 8.0 - 11.0    | 10.0 - 14.0    |
|                            | Molybdenum      | 0.15 - 0.25    |               | 2.00 - 3.00    |

| <b>Recommended Mating Materials</b> | Bolt Grade  | Nuts Spec/Grade | Washers Spec/Grade |
|-------------------------------------|-------------|-----------------|--------------------|
|                                     | B7          | A194 Grade 2H   | F436               |
|                                     | B8 Class 1  | A194 Grade 8    | SS304              |
|                                     | B8M Class 1 | A194 Grade 8M   | SS316              |
|                                     | B8 Class 2  | A194 Grade 8    | SS304              |
|                                     | B8M Class 2 | A194 Grade 8M   | SS316              |

## A193 B7 Stud Bolts & A194 2H Nuts

stud bolts is from a quality European supplier with products that are manufactured with full traceability and certification. Accordingly these are suitable for use in applications in the gas, petrochemical, power and heavy engineering industries.

ASTM A193 Grade B7 High strength carbon alloy steel.



Please note we are also able to supply special indent orders for other lengths and diameters of B7 Stud Bolts and the following grades:

- ASTM A193 B16
- ASTM A193 B8 & B8M
- ASTM A320 L7
- Duplex and Super Duplex in various trade designations

EDL is able to cut stud bar to your required length on request.

PTFE coating and other finishes also available on request.

| Dia | Length |          | Self Colour | Zinc Coated |
|-----|--------|----------|-------------|-------------|
|     | Metric | Imperial | Part No     | Part No     |
| 1/2 | 60     | 2.1/4    | 63B712060   | 63B712060Z  |
| 1/2 | 65     | 2.1/2    | 63B712065   | 63B712065Z  |
| 1/2 | 70     | 2.3/4    | 63B712070   | 63B712070Z  |
| 1/2 | 75     | 3        | 63B712075   | 63B712075Z  |
| 1/2 | 80     | 3.1/4    | 63B712080   | 63B712080Z  |
| 1/2 | 100    | 4        | 63B712100   | 63B712100Z  |

| Dia | Length |          | Self Colour | Zinc Coated |
|-----|--------|----------|-------------|-------------|
|     | Metric | Imperial | Part No     | Part No     |
| 5/8 | 65     | 2.1/2    | 63B758065   | 63B758065Z  |
| 5/8 | 70     | 2.3/4    | 63B758070   | 63B758070Z  |
| 5/8 | 75     | 3        | 63B758075   | 63B758075Z  |
| 5/8 | 80     | 3.1/4    | 63B758080   | 63B758080Z  |
| 5/8 | 90     | 3.1/2    | 63B758090   | 63B758090Z  |
| 5/8 | 100    | 4        | 63B758100   | 63B758100Z  |
| 5/8 | 110    | 4.1/2    | 63B758110   | 63B758110Z  |
| 5/8 | 120    | 4.3/4    | 63B758120   | 63B758120Z  |
| 5/8 | 130    | 5.1/4    | 63B758130   | 63B758130Z  |
| 5/8 | 140    | 5.1/2    | 63B758140   | 63B758140Z  |
| 5/8 | 150    | 6        | 63B758150   | 63B758150Z  |
| 5/8 | 160    | 6.1/4    | 63B758160   | 63B758160Z  |
| 5/8 | 170    | 6.3/4    | 63B758170   | 63B758170Z  |
| 5/8 | 180    | 7        | 63B758180   | 63B758180Z  |
| 5/8 | 190    | 7.1/2    | 63B758190   | 63B758190Z  |
| 5/8 | 200    | 8        | 63B758200   | 63B758200Z  |

| Dia | Length |          | Self Colour | Zinc Coated |
|-----|--------|----------|-------------|-------------|
|     | Metric | Imperial | Part No     | Part No     |
| 3/4 | 75     | 3        | 63B734075   | 63B734075Z  |
| 3/4 | 80     | 3.1/4    | 63B734080   | 63B734080Z  |
| 3/4 | 90     | 3.1/2    | 63B734090   | 63B734090Z  |
| 3/4 | 100    | 4        | 63B734100   | 63B734100Z  |
| 3/4 | 110    | 4.1/2    | 63B734110   | 63B734110Z  |
| 3/4 | 120    | 4.3/4    | 63B734120   | 63B734120Z  |
| 3/4 | 130    | 5.1/4    | 63B734130   | 63B734130Z  |
| 3/4 | 140    | 5.1/2    | 63B734140   | 63B734140Z  |
| 3/4 | 150    | 6        | 63B734150   | 63B734150Z  |
| 3/4 | 160    | 6.1/4    | 63B734160   | 63B734160Z  |
| 3/4 | 170    | 6.3/4    | 63B734170   | 63B734170Z  |
| 3/4 | 180    | 7        | 63B734180   | 63B734180Z  |
| 3/4 | 190    | 7.1/2    | 63B734190   | 63B734190Z  |
| 3/4 | 200    | 8        | 63B734200   | 63B734200Z  |
| 3/4 | 210    | 8.1/4    | 63B734210   | 63B734210Z  |
| 3/4 | 220    | 8.3/4    | 63B734220   | 63B734220Z  |
| 3/4 | 230    | 9        | 63B734230   | 63B734230Z  |
| 3/4 | 240    | 9.1/2    | 63B734240   | 63B734240Z  |
| 3/4 | 250    | 10       | 63B734250   | 63B734250Z  |

| Dia | Length |        | Self Colour | Zinc Coated |
|-----|--------|--------|-------------|-------------|
|     | UNC    | Metric | Imperial    | Part No     |
| 7/8 | 90     | 3.1/2  | 63B778090   | 63B778090Z  |
| 7/8 | 100    | 4      | 63B778100   | 63B778100Z  |
| 7/8 | 110    | 4.1/2  | 63B778110   | 63B778110Z  |
| 7/8 | 120    | 4.3/4  | 63B778120   | 63B778120Z  |
| 7/8 | 130    | 5.1/4  | 63B778130   | 63B778130Z  |
| 7/8 | 140    | 5.1/2  | 63B778140   | 63B778140Z  |
| 7/8 | 150    | 6      | 63B778150   | 63B778150Z  |
| 7/8 | 160    | 6.1/4  | 63B778160   | 63B778160Z  |
| 7/8 | 170    | 6.3/4  | 63B778170   | 63B778170Z  |
| 7/8 | 180    | 7      | 63B778180   | 63B778180Z  |
| 7/8 | 190    | 7.1/2  | 63B778190   | 63B778190Z  |
| 7/8 | 200    | 8      | 63B778200   | 63B778200Z  |
| 7/8 | 210    | 8.1/4  | 63B778210   | 63B778210Z  |
| 7/8 | 220    | 8.3/4  | 63B778220   | 63B778220Z  |
| 7/8 | 230    | 9      | 63B778230   | 63B778230Z  |
| 7/8 | 240    | 9.1/2  | 63B778240   | 63B778240Z  |
| 7/8 | 250    | 10     | 63B778250   | 63B778250Z  |

| Dia   | Length |        | Self Colour | Zinc Coated |
|-------|--------|--------|-------------|-------------|
|       | UNC    | Metric | Imperial    | Part No     |
| 1.1/8 | 120    | 4.3/4  | 63B7118120  | 63B7118120Z |
| 1.1/8 | 130    | 5.1/4  | 63B7118130  | 63B7118130Z |
| 1.1/8 | 140    | 5.1/2  | 63B7118140  | 63B7118140Z |
| 1.1/8 | 150    | 6      | 63B7118150  | 63B7118150Z |
| 1.1/8 | 160    | 6.1/4  | 63B7118160  | 63B7118160Z |
| 1.1/8 | 170    | 6.3/4  | 63B7118170  | 63B7118170Z |
| 1.1/8 | 180    | 7      | 63B7118180  | 63B7118180Z |
| 1.1/8 | 190    | 7.1/2  | 63B7118190  | 63B7118190Z |
| 1.1/8 | 200    | 8      | 63B7118200  | 63B7118200Z |
| 1.1/8 | 210    | 8.1/4  | 63B7118210  | 63B7118210Z |
| 1.1/8 | 220    | 8.3/4  | 63B7118220  | 63B7118220Z |
| 1.1/8 | 230    | 9      | 63B7118230  | 63B7118230Z |
| 1.1/8 | 240    | 9.1/2  | 63B7118240  | 63B7118240Z |
| 1.1/8 | 250    | 10     | 63B7118250  | 63B7118250Z |

| Dia | Length |        | Self Colour | Zinc Coated |
|-----|--------|--------|-------------|-------------|
|     | UNC    | Metric | Imperial    | Part No     |
| 1   | 100    | 4      | 63B711100   | 63B711100Z  |
| 1   | 110    | 4.1/2  | 63B711110   | 63B711110Z  |
| 1   | 120    | 4.3/4  | 63B711120   | 63B711120Z  |
| 1   | 130    | 5.1/4  | 63B711130   | 63B711130Z  |
| 1   | 140    | 5.1/2  | 63B711140   | 63B711140Z  |
| 1   | 150    | 6      | 63B711150   | 63B711150Z  |
| 1   | 160    | 6.1/4  | 63B711160   | 63B711160Z  |
| 1   | 170    | 6.3/4  | 63B711170   | 63B711170Z  |
| 1   | 180    | 7      | 63B711180   | 63B711180Z  |
| 1   | 190    | 7.1/2  | 63B711190   | 63B711190Z  |
| 1   | 200    | 8      | 63B71200    | 63B71200Z   |
| 1   | 210    | 8.1/4  | 63B71210    | 63B71210Z   |
| 1   | 220    | 8.3/4  | 63B71220    | 63B71220Z   |
| 1   | 230    | 9      | 63B71230    | 63B71230Z   |
| 1   | 240    | 9.1/2  | 63B71240    | 63B71240Z   |
| 1   | 250    | 10     | 63B71250    | 63B71250Z   |

| Dia   | Length |        | Self Colour | Zinc Coated |
|-------|--------|--------|-------------|-------------|
|       | UNC    | Metric | Imperial    | Part No     |
| 1.1/4 | 130    | 5      | 63B7114130  | 63B7114130Z |
| 1.1/4 | 140    | 5.1/2  | 63B7114140  | 63B7114140Z |
| 1.1/4 | 150    | 6      | 63B7114150  | 63B7114150Z |
| 1.1/4 | 160    | 6.1/4  | 63B7114160  | 63B7114160Z |
| 1.1/4 | 170    | 6.3/4  | 63B7114170  | 63B7114170Z |
| 1.1/4 | 180    | 7      | 63B7114180  | 63B7114180Z |
| 1.1/4 | 190    | 7.1/2  | 63B7114190  | 63B7114190Z |
| 1.1/4 | 200    | 8      | 63B7114200  | 63B7114200Z |
| 1.1/4 | 210    | 8.1/4  | 63B7114210  | 63B7114210Z |
| 1.1/4 | 220    | 8.3/4  | 63B7114220  | 63B7114220Z |
| 1.1/4 | 230    | 9      | 63B7114230  | 63B7114230Z |
| 1.1/4 | 240    | 9.1/2  | 63B7114240  | 63B7114240Z |
| 1.1/4 | 250    | 10     | 63B7114250  | 63B7114250Z |