



# PROPERTIES OF STRUCTURAL BOLT & NUT AS PER A490

| NOMINAL DIAMETER | PITCH in TPI |     |     | stress area in mm <sup>2</sup> |       |       | BOLT, SCREW & STUD ASTM A490-1 |                   |                   |                     |             | HEAVY HEX NUT ASTM A563 DH* |               |                   |                |              |
|------------------|--------------|-----|-----|--------------------------------|-------|-------|--------------------------------|-------------------|-------------------|---------------------|-------------|-----------------------------|---------------|-------------------|----------------|--------------|
|                  | SIZE         | UNC | UNF | 8UN                            | UNC   | UNF   | 8UN                            | Proof Stress N/mm | Proof Load UNC KN | Tensile Stress N/mm | Torque* N m | Hardness HRC                | ELONGATION# % | Proof Stress N/mm | Proof Load UNC | Hardness HRC |
| 1/4              | 20           | 28  |     | 20.5                           | 23.5  |       |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 5/16             | 18           | 24  |     | 33.8                           | 37.5  |       |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 3/8              | 16           | 24  |     | 50.0                           | 56.7  |       |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 7/16             | 14           | 20  |     | 68.6                           | 76.6  |       |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 1/2              | 13           | 20  |     | 91.5                           | 103   | 91.5  | 827                            | 75.7              | 1034-1192         | 129.1               | 33-39       | 14.0                        | 1206          | 110.4             | 24-38          |              |
| 9/16             | 12           | 18  |     | 117                            | 131   | 117   | 827                            | 97.1              | 1034-1192         | 186.2               | 33-39       | 14.0                        | 1206          | 141.6             | 24-38          |              |
| 5/8              | 11           | 18  |     | 146                            | 165   | 146   | 827                            | 120.6             | 1034-1192         | 257.0               | 33-39       | 14.0                        | 1206          | 175.8             | 24-38          |              |
| 3/4              | 10           | 16  |     | 216                            | 241   | 216   | 827                            | 178.5             | 1034-1192         | 456.4               | 33-39       | 14.0                        | 1206          | 260.2             | 24-38          |              |
| 7/8              | 9            | 14  |     | 298                            | 329   | 298   | 827                            | 246.4             | 1034-1192         | 735.1               | 33-39       | 14.0                        | 1206          | 359.3             | 24-38          |              |
| 1                | 8            | 12  | 8   | 391                            | 428   | 391   | 827                            | 323.2             | 1034-1192         | 1,102               | 33-39       | 14.0                        | 1206          | 471.3             | 24-38          |              |
| 1 1/16           |              |     | 8   |                                |       | 448   | 827                            | -                 | 1034-1192         | -                   | 33-39       | 14.0                        | 1206          | -                 | 24-38          |              |
| 1 1/8            | 7            | 12  | 8   | 492                            | 552   | 510   | 827                            | 407.2             | 1034-1192         | 1,562               | 33-39       | 14.0                        | 1206          | 593.9             | 24-38          |              |
| 1 3/16           |              |     | 8   |                                |       | 575   | 827                            | -                 | 1034-1192         | -                   | 33-39       | 14.0                        | 1206          | -                 | 24-38          |              |
| 1 1/4            | 7            | 12  | 8   | 625                            | 692   | 645   | 827                            | 517.1             | 1034-1192         | 2,204               | 33-39       | 14.0                        | 1206          | 754.0             | 24-38          |              |
| 1 5/16           |              |     | 8   |                                |       | 718   | 827                            | -                 | 1034-1192         | -                   | 33-39       | 14.0                        | 1206          | -                 | 24-38          |              |
| 1 3/8            | 6            | 12  | 8   | 745                            | 848   | 796   | 827                            | 616.2             | 1034-1192         | 2,889               | 33-39       | 14.0                        | 1206          | 898.6             | 24-38          |              |
| 1 7/16           |              |     | 8   |                                |       | 877   | 827                            | -                 | 1034-1192         | -                   | 33-39       | 14.0                        | 1206          | -                 | 24-38          |              |
| 1 1/2            | 6            | 12  | 8   | 907                            | 1,020 | 962   | 827                            | 749.8             | 1034-1192         | 3,835               | 33-39       | 14.0                        | 1206          | 1,093             | 24-38          |              |
| 1 9/16           |              |     | 8   |                                |       | 1,052 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 1 5/8            |              |     | 8   |                                |       | 1,145 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 1 11/16          |              |     | 8   |                                |       | 1,242 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 1 3/4            | 5            |     | 8   | 1,225                          |       | 1,343 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 1 7/8            |              |     | 8   |                                |       | 1,557 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 2                | 4 1/2        |     | 8   | 1,612                          |       | 1,788 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 2 1/4            | 4 1/2        |     | 8   | 2,095                          |       | 2,295 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 2 1/2            | 4            |     | 8   | 2,580                          |       | 2,866 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 2 3/4            |              |     | 8   |                                |       | 3,819 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 3                |              |     | 8   |                                |       | 4,198 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 3 1/4            |              |     | 8   |                                |       | 4,959 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 3 1/2            |              |     | 8   |                                |       | 5,783 |                                |                   |                   |                     |             |                             |               |                   |                |              |
| 4                |              |     | 8   |                                |       | 7,621 |                                |                   |                   |                     |             |                             |               |                   |                |              |

| DIMENSION  | HEAVY HEX           | HEAVY HEX |
|------------|---------------------|-----------|
| MARKING    | 'A490' '10S'        | 'DH'      |
| CARBON     | 0.30-0.48/0.35-0.53 | 0.18-0.58 |
| MANAGENESE | 1.65-               | 0.57-     |
| SULPHUR    | -0.04               | -0.058    |
| SILICON    | 0.60-               |           |
| CHROMIUM   | 3.99-               |           |
| MOLYBDENUM |                     |           |
| NICKLE     |                     |           |
| VANADIUM   |                     |           |
| PHOPHORUS  |                     | -0.48     |
| MATERIAL   | Alloy Steel         |           |

**Notes:**

- 1. 8UN means less than 1" UNC thread and above 1" 8 TPI thread
- 2. Left hand side of '-' is minium value right hand side of '-' is maximum value  
Eg. 0.5-0.7 min is 0.5 and max is 0.7  
Eg. -0.8 max is 0.8 no minimam value  
Eg. 2.0- min is 2.0 no maximam value

\* Alternative ASTM A194 2H can be used  
# Elongation in length of 2 times Diameter

\* Torque value based on 75% of proof load and finish as recieved steel

| Metric Units is followed, if not available it has been converted to metric unit for uniformity