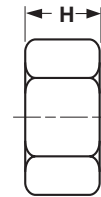
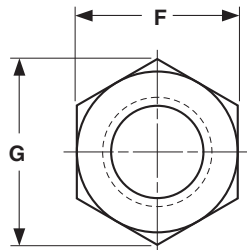


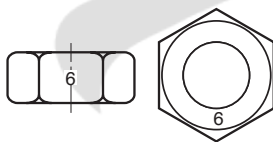
# METRIC FASTENERS

## NUTS

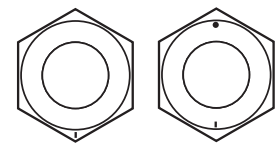
## ISO 4032 Hex Nuts Style 1 & Class 6



| METRIC - HEX NUTS, STYLE 1 |              |                    |       |                      |           | ISO 4032 |
|----------------------------|--------------|--------------------|-------|----------------------|-----------|----------|
| Nominal Size               | Thread Pitch | F                  |       | G                    | H         |          |
|                            |              | Width Across Flats |       | Width Across Corners | Thickness |          |
|                            |              | Max                | Min   | Min                  | Max       | Min      |
| M1.6                       | 0.35         | 3.2                | 3.02  | 3.41                 | 1.3       | 1.05     |
| M2                         | 0.4          | 4                  | 3.82  | 4.32                 | 1.6       | 1.35     |
| M2.5                       | 0.45         | 5                  | 4.82  | 5.45                 | 2         | 1.75     |
| M3                         | 0.5          | 5.5                | 5.32  | 6.01                 | 2.4       | 2.15     |
| M4                         | 0.7          | 7                  | 6.78  | 7.66                 | 3.2       | 2.9      |
| M5                         | 0.8          | 8                  | 7.78  | 8.79                 | 4.7       | 4.4      |
| M6                         | 1            | 10                 | 9.78  | 11.05                | 5.2       | 4.9      |
| M8                         | 1.25         | 13                 | 12.73 | 14.38                | 6.8       | 6.44     |
| M10                        | 1.5          | 16                 | 15.73 | 17.77                | 8.4       | 8.04     |
| M12                        | 1.75         | 18                 | 17.73 | 20.03                | 10.8      | 10.37    |
| M14                        | 2            | 21                 | 20.67 | 23.35                | 12.8      | 12.1     |
| M16                        | 2            | 24                 | 23.67 | 26.75                | 14.8      | 14.1     |
| M20                        | 2.5          | 30                 | 29.16 | 32.95                | 18        | 16.9     |
| M24                        | 3            | 36                 | 35    | 39.55                | 21.5      | 20.2     |
| M30                        | 3.5          | 46                 | 45    | 50.85                | 25.6      | 24.3     |
| M36                        | 4            | 55                 | 53.8  | 60.79                | 31        | 29.4     |



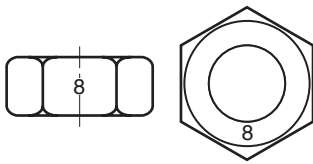
## CLASS 6 HEX NUTS



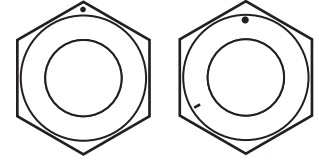
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>              | A six-sided internally threaded, non-heat treated fastener with a metric thread pitch. Nuts M16 and smaller are chamfered on the top and the bearing surface. Nuts M18 and larger may be either double chamfered, or have a washer face on one side and a chamfered surface on the opposite side.                                                                                                                                                |
| <b>Applications/ Advantages</b> | Class 6 nuts are intended for use with screws and bolts of property class 6.8 or lower. They are the most popular nut for use with metric machine screws.                                                                                                                                                                                                                                                                                        |
| <b>Material</b>                 | Class 6 nuts shall be made of a steel which conforms to the following chemical composition--<br><b>Carbon:</b> 0.50% maximum; <b>Phosphorus:</b> 0.060% maximum; <b>Sulfur:</b> 0.150% maximum.<br><br>Class 6 nuts may also be made from free-cutting steel which conforms to the following chemical composition--<br><b>Carbon:</b> 0.50% maximum; <b>Sulfur:</b> 0.34% minimum; <b>Phosphorus:</b> 0.11% minimum; <b>Lead:</b> 0.35% minimum. |
| <b>Hardness</b>                 | <b>Diam. thru M16:</b> Vickers HV 150 - 302 (Rockwell B78.7 - C30); <b>Diam. M18 thru M39:</b> Vickers HV 170 - 302 (Rockwell B85 - C30)                                                                                                                                                                                                                                                                                                         |
| <b>Proof Load</b>               | <b>Diameters M1.6 through M4:</b> 600 N/mm <sup>2</sup><br><b>Diameters M5 through M7:</b> 670 N/mm <sup>2</sup><br><b>Diameters M8 through M10:</b> 680 N/mm <sup>2</sup><br><b>Diameters M12 through M16:</b> 700 N/mm <sup>2</sup><br><b>Diameters M18 through M36:</b> 720 N/mm <sup>2</sup>                                                                                                                                                 |
| <b>Plating</b>                  | See Appendix-A for plating information                                                                                                                                                                                                                                                                                                                                                                                                           |

Classes 8 & 10 & A2-70

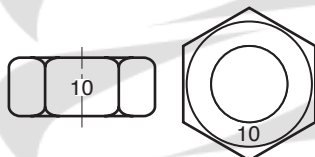
NUTS



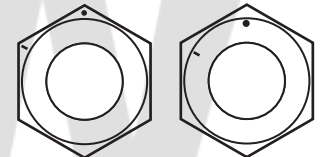
**CLASS 8 HEX NUTS**



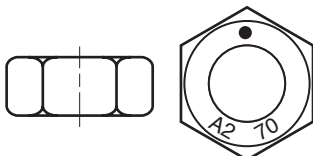
|                                |                                                                                                                                                                                                                                                                                               |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>             | A Style 1 hex nut with a metric thread pitch. Nuts M16 and smaller are chamfered top and bottom, and are not heat-treated. Nuts M18 and larger are (1) heat-treated and (2) may be double chamfered, or have a washer face on one side and a chamfered surface on the opposite side.          |
| <b>Applications/Advantages</b> | Class 8 nuts are intended for use with screws & bolts of property class 8.8 or lower. They are widely used in the automotive and electronics industries.                                                                                                                                      |
| <b>Material</b>                | Class 8 nuts shall be made of a steel which conforms to the following chemical composition--<br><b>Carbon:</b> 0.58% maximum; <b>Manganese:</b> 0.25% minimum; <b>Phosphorus:</b> 0.060% maximum; <b>Sulfur:</b> 0.150% maximum.                                                              |
| <b>Heat Treatment</b>          | Class 8 nuts of diameter 18mm or greater shall be heat treated by quenching in a liquid medium from a temperature above the transformation temperature and tempering at a temperature of at least 425°C.                                                                                      |
| <b>Hardness</b>                | <b>Diameters M1.6 through M4:</b> Vickers HV 180 - 302 (Rockwell B87.1 - C30)<br><b>Diameters M5 through M16:</b> Vickers HV 200 - 302 (Rockwell B91.5 - C30)<br><b>Diameters through M18 through M39:</b> Vickers HV 233 - 353 (Rockwell C18 - 36)                                           |
| <b>Proof Load</b>              | <b>Diameters M1.6 through M4:</b> 800 N/mm <sup>2</sup> / <b>Diameters M5 through M7:</b> 855 N/mm <sup>2</sup> / <b>Diameters M8 through M10:</b> 870 N/mm <sup>2</sup><br><b>Diameters M12 through M16:</b> 880 N/mm <sup>2</sup> / <b>Diameters M18 through M36:</b> 920 N/mm <sup>2</sup> |
| <b>Plating</b>                 | See Appendix-A for plating information                                                                                                                                                                                                                                                        |



**CLASS 10 HEX NUTS**



|                                |                                                                                                                                                                                                                                                                         |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>             | A Style 1, heat treated fastener with a metric thread pitch. Nuts M16 and smaller are chamfered on the top and the bearing surface. Nuts M20 and larger may be either double chamfered, or have a washer face on one side and a chamfered surface on the opposite side. |
| <b>Applications/Advantages</b> | Class 10 nuts are intended for use with screws and bolts of property classes 10.9 and lower. They are widely used in farm equipment.                                                                                                                                    |
| <b>Material</b>                | Class 10 nuts shall be made of a steel which conforms to the following chemical composition-- <b>Carbon:</b> 0.58% maximum; <b>Manganese:</b> 0.30% minimum; <b>Phosphorus:</b> 0.048% maximum; <b>Sulfur:</b> 0.058% maximum.                                          |
| <b>Heat Treatment</b>          | Class 10 nuts shall be heat treated by quenching in a liquid medium from a temperature above the transformation temperature and tempering at a temperature of at least 425°C.                                                                                           |
| <b>Hardness</b>                | Rockwell C26 - 36 (Vickers HV 272 - 353)                                                                                                                                                                                                                                |
| <b>Proof Load</b>              | <b>Diameters through M10:</b> 1040 N/mm <sup>2</sup> / <b>Diameters M12 through M16:</b> 1050 N/mm <sup>2</sup> / <b>Diameters M18 through M39:</b> 1060 N/mm <sup>2</sup>                                                                                              |
| <b>Plating</b>                 | See Appendix-A for plating information                                                                                                                                                                                                                                  |



**CLASS A2-70 HEX NUTS**

|                                |                                                                                                                        |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>             | A Style 1, fastener with a metric thread pitch. Nuts M16 and smaller are chamfered on the top and the bearing surface. |
| <b>Applications/Advantages</b> | Class A2-70 nuts are intended for use with stainless screws and bolts. They are widely used in farm equipment.         |
| <b>Material</b>                | A2-70 Stainless Steel                                                                                                  |
| <b>Plating</b>                 | Stainless nuts are usually supplied without supplemental plating.                                                      |