



| REGULAR & HIGH ALLOY HELICAL SPRING LOCKWASHERS | | | | | | | ASME B18.21.1-1999 |
|---|-------|-----------------|-------|------------------|------------------------|---------------|--------------------|
| Nominal Washer Size | | A | | B | $\frac{(T+t)}{2}$ | W | |
| | | Inside Diameter | | Outside Diameter | Mean Section Thickness | Section Width | |
| | | Max | Min | Max | Min | Min | |
| #2 | 0.086 | 0.094 | 0.088 | 0.172 | 0.020 | 0.035 | |
| #3 | 0.099 | 0.107 | 0.101 | 0.195 | 0.025 | 0.040 | |
| #4 | 0.112 | 0.120 | 0.114 | 0.209 | 0.025 | 0.040 | |
| #5 | 0.125 | 0.133 | 0.127 | 0.236 | 0.031 | 0.047 | |
| #6 | 0.138 | 0.148 | 0.141 | 0.250 | 0.031 | 0.047 | |
| #8 | 0.164 | 0.174 | 0.167 | 0.293 | 0.040 | 0.055 | |
| #10 | 0.190 | 0.200 | 0.193 | 0.334 | 0.047 | 0.062 | |
| #12 | 0.216 | 0.227 | 0.220 | 0.377 | 0.056 | 0.070 | |
| 1/4 | 0.250 | 0.260 | 0.252 | 0.487 | 0.062 | 0.109 | |
| 5/16 | 0.312 | 0.322 | 0.314 | 0.583 | 0.078 | 0.125 | |
| 3/8 | 0.375 | 0.385 | 0.377 | 0.680 | 0.094 | 0.141 | |
| 7/16 | 0.438 | 0.450 | 0.440 | 0.776 | 0.109 | 0.156 | |
| 1/2 | 0.500 | 0.512 | 0.502 | 0.869 | 0.125 | 0.171 | |
| 9/16 | 0.562 | 0.574 | 0.564 | 0.965 | 0.141 | 0.188 | |
| 5/8 | 0.625 | 0.641 | 0.628 | 1.073 | 0.156 | 0.203 | |
| 3/4 | 0.750 | 0.766 | 0.753 | 1.265 | 0.188 | 0.234 | |
| 7/8 | 0.875 | 0.894 | 0.878 | 1.459 | 0.219 | 0.266 | |
| 1 | 1.000 | 1.024 | 1.003 | 1.656 | 0.250 | 0.297 | |
| 1-1/8 | 1.125 | 1.153 | 1.129 | 1.847 | 0.281 | 0.328 | |
| 1-1/4 | 1.250 | 1.280 | 1.254 | 2.036 | 0.312 | 0.359 | |
| 1-3/8 | 1.375 | 1.408 | 1.379 | 2.219 | 0.344 | 0.391 | |
| 1-1/2 | 1.500 | 1.534 | 1.504 | 2.419 | 0.375 | 0.422 | |
| 1-3/4 | 1.750 | 1.789 | 1.758 | 2.679 | 0.389 | 0.424 | |
| 2 | 2.000 | 2.039 | 2.008 | 2.936 | 0.422 | 0.427 | |

| | |
|--------------------------------|--|
| Description | <p>Regular: A coiled, hardened, split circular washer with a slightly trapezoidal wire section.</p> <p>High-Alloy: Dimensionally identical to a regular split lock washer but made from 4037 alloy steel (sizes over 1" are equivalent to heavy split lockwashers in size and material).</p> <p>Stainless: A regular split lock washer made from austenitic stainless steel.</p> |
| Applications/Advantages | <p>Regular: (A) Applies greater bolt tension per unit of applied torque; (B) Provides a hardened bearing surface, creating more uniform torque control; (C) Provides more uniform load distribution; (D) Resists loosening caused by vibration and corrosion; (E) Is preferred lockwasher for use with hardened bearing surfaces.</p> <p>High-Alloy: Designed for use with Grade-5 & Grade-8 bolts and nuts.</p> <p>Stainless: For use with stainless nuts and screws of a similar stainless alloy in corrosive environments.</p> |
| Material | <p>Carbon Steel: SAE J403 1055 - 1065 carbon steel.</p> <p>High-Alloy Steel: 1/4 thru 1": SAE J404 4037 alloy steel; 1-1/8 thru 1-1/2": SAE J403 1055 - 1065 carbon steel</p> <p>18-8 Stainless: SAE J405 302 - 305 stainless steel.</p> <p>316 Stainless: SAE J405 316 stainless steel.</p> |
| Hardness | <p>Carbon & High-Alloy Steel: Rockwell C38 - 46</p> <p>Stainless: Thru 5/8": Rockwell C35 - 43; Sizes over 5/8": Rockwell C32 - 43</p> |
| Twist Test | With the washer in a vice with the split ends free and straight above the vice jaws, a 90° segment of the free end is gripped with a wrench and bent. Washers are to withstand being twisted through a 90° angle without signs of fracture. When the washer ultimately fractures beyond the prescribed 90° limit, the structure at the breaking point shall show a fine grain. |
| Plating | See Appendix-A for information about the plating of carbon steel and alloy steel lock washers. |