





























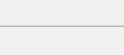

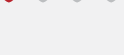


|  |  |   |   |  |
|--|--|---|---|--|
| <b>Bend Rating Key:</b><br><br>ESI's Bend Rating scale measures the formability of a material based on its ability to bend or form without tearing or breaking. "Green" designates easier formability all the way through "red" as most difficult. | <div><br/><b>Green</b><br/><br/>Easy formability<br/><br/></div> | <div><br/><b>Yellow</b><br/><br/>Moderate formability;<br/>possible strain<br/><br/></div> | <div><br/><b>Orange</b><br/><br/>Limited formability;<br/>chance of tearing<br/><br/></div> | <div><br/><b>Red</b><br/><br/>Difficult formability;<br/>likelihood of tearing<br/><br/></div> |
|  | Radii for various thicknesses, whereas "t"=times thickness.  | 0t to 3t  | 3t to 6t  | 6t to 9t   |

## Steel

|                 | Summary   | Recommended Finishes?                                      | Applications  | Conditions Available                  | Bend Rating   | Magnetic? | Tensile Strength Minimum (KSI) |     | Elongation Minimum (% 2" Gauge) | Yield Strength Minimum (0.2% offset) |     | Hardness (Min-Max) | Density (lb/cu in) |         | Corrosion Resistance  | Cost?    |
|-----------------|---|--|---|---------------------------------------|---|-----------|--------------------------------|-----|---------------------------------|--------------------------------------|-----|--------------------|--------------------|---------|---|----------|
|                 |   |  |   |                                       |   |           | KSI                            | MPa |                                 | KSI                                  | MPa |                    | (lb/in³)           | (g/cm³) |   |          |
| C1006           | Carbon steels are steels that have carbon as the main alloying element. They contain about 1.2% of manganese and 0.4% of silicon. There are other materials present in small quantities in these carbon steels, such as copper, aluminum, molybdenum, nickel, and chromium. Features of C1006 include ductility and softness. | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Appliances, automobiles, magnet core applications   | AISI 1006 Carbon Steel                |  | Yes       | 35                             | 241 | 38%                             | N/A                                  | N/A | Rockwell B30-B50   | 0.2836             | 7.850   |  | \$\$\$\$ |
| C1008/<br>C1010 | This most common carbon steel has excellent weldability, which includes brazeability, spot and fusion, butt, and projection.  | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Virtually all industries. Brackets, Clips, Plates, Washers, Spacers Housings, Weldments.                    | AISI 1008 #5 Temper Soft              |  | Yes       | 44                             | 303 | 33%                             | 25                                   | 172 | Rockwell B55 Max   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1008 #4 Temper Skin Pass         |  | Yes       | 48                             | 331 | 24%                             | 35                                   | 241 | Rockwell B65 Max   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1008 #3 Temper 1/4 Hard          |  | Yes       | 55                             | 379 | 22%                             | 42                                   | 290 | Rockwell B60-B75   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1008 #2 Temper 1/2 Hard          |  | Yes       | 65                             | 448 | 20%                             | 50                                   | 345 | Rockwell B70-B85   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1008 #1 Temper Full Hard         |  | Yes       | 80                             | 552 | 16%                             | 60                                   | 414 | Rockwell B84 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |
| C1018           | C1018, one of the most regularly available grades around the world, is a free machining grade that can be easily formed, machined, welded, and fabricated.  | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Shafts, spindles, pins, rods, sprocket assemblies   | AISI 1018 Carbon Steel                |  | Yes       | 64                             | 441 | 15%                             | 54                                   | 372 | Rockwell B71 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |
| C1050           | C1050 is a medium carbon, medium tensile steel with solid strength and toughness.   | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Shafts, machinery parts, bolts, pinions, gears  | AISI 1050 Annealed                    |  | Yes       | 90                             | 621 | 20%                             | 58                                   | 400 | Rockwell B84 Max   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1050 Hardened                    |  | Yes       | 110                            | 758 | 3%                              | 100                                  | 689 | Rockwell C22-58    | 0.2836             | 7.850   |  | \$\$\$\$ |
| C1074/<br>C1075 | C1074 steel is a carbon, non-alloy steel made for primary forming into wrought products.  | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Blades, clips, brackets, brake discs, clutches, springs, washers, wear strips                               | AISI 1074/1075 Annealed               |  | Yes       | 94                             | 648 | 10%                             | 62                                   | 427 | Rockwell B86 Max   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1074/1075 Hardened               |  | Yes       | N/A                            | N/A | N/A                             | N/A                                  | N/A | Rockwell C25-64    | 0.2836             | 7.850   |  | \$\$\$\$ |
| C1095           | C1095 is a basic form of carbon steel and is frequently used in the construction of knives. It has a carbon content of .95%, which hardens the material and lessens the wear that a blade will encounter over time.   | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Springs, cutting tools  | AISI 1095 Annealed                    |  | Yes       | 99                             | 683 | 10%                             | 76                                   | 524 | Rockwell B86 Max   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | AISI 1095 Hardened                    |  | Yes       | N/A                            | N/A | N/A                             | N/A                                  | N/A | Rockwell C30-66    | 0.2836             | 7.850   |  | \$\$\$\$ |
| HSLA            | HSLA, or high-strength low-alloy steel, is a type of carbon steel with low amounts of alloying elements that are added to its chemical composition to primarily increase its strength.  | Zinc, Nickel, Zinc-Nickel, Mechanical and Organic finishes | Automotive, Bridge and similar construction applications, oil and gas transmission pipelines, storage tanks | HSLA Carbon Steel ASTM A36, Grade 36  |  | Yes       | 58                             | 400 | 22%                             | 36                                   | 248 | Rockwell B68 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | HSLA Carbon Steel ASTM A572, Grade 50 |  | Yes       | 58                             | 400 | 20%                             | 50                                   | 345 | Rockwell B75 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | HSLA Carbon Steel ASTM A656, Grade 60 |  | Yes       | 70                             | 483 | 18%                             | 60                                   | 414 | Rockwell B88 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |
|                 |   |  |   | HSLA Grade 80                         |  | Yes       | 100                            | 689 | 12%                             | 80                                   | 552 | Rockwell B90 Min   | 0.2836             | 7.850   |  | \$\$\$\$ |

### About Us

Engineering Specialties Inc. (ESI) delivers custom manufacturing solutions, specializing in production metal stamping, CNC machining and advanced assembly capabilities. For more information about ESI, visit [www.esict.com](http://www.esict.com).

Contact Us Today

View our Resource Library