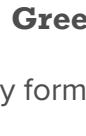
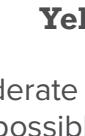
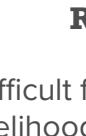
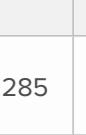
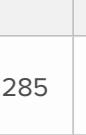
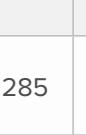
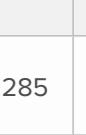
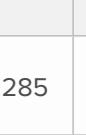
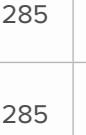
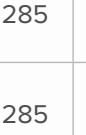
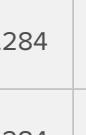
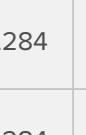
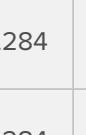
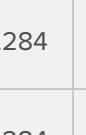
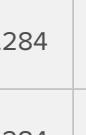
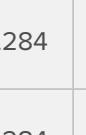
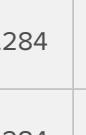
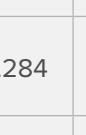
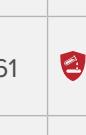
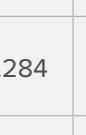
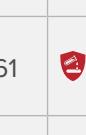
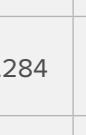
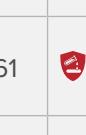


## Stamping Material Selection Guide

<b>Bend Rating Key:</b>		 <b>Green</b>	 <b>Yellow</b>	 <b>Orange</b>	 <b>Red</b>
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.	Easy formability	Moderate formability; possible strain	Limited formability; chance of tearing	Difficult formability; likelihood of tearing	
Radii for various thicknesses, whereas "t"=times thickness.	0t to 3t	3t to 6t	6t to 9t	9t +	

### Stainless 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	KSI	MPa		(lb/in <sup>3</sup> )	(g/cm <sup>3</sup> )		
201	201 can be substituted for stainless steel type 301 in applications with mild environments and offers a higher yield strength than the 300 series, but is less resistant to corrosion. It must be hardened by cold working, not heat treatment.	Passivation	Springs, fasteners, clamps, display racks, food service applications (cooking utensils, sinks, appliances)	201 Annealed		Slightly if work hardened	75	517	40%	38	262	Rockwell B91 Max	0.283	7.833			
				201 1/4 Hard		Slightly if work hardened	125	862	25%	75	517	Rockwell C25-C30	0.283	7.833			
				201 1/2 Hard		Slightly if work hardened	150	1034	18%	110	758	Rockwell C30-C35	0.283	7.833			
				201 3/4 Hard		Slightly if work hardened	175	1207	12%	135	931	Rockwell C35-C40	0.283	7.833			
				201 Full Hard		Slightly if work hardened	185	1276	9%	145	1000	Rockwell C40-C45	0.283	7.833			
301	301 has great corrosion resistance, high strength, and ductility. It must be hardened by cold working, not heat treatment.	Passivation, Electro-polish	Gaskets, automotive parts, aerospace components, electrical components, fasteners, blades	301 Annealed		Slightly if work hardened	110	758	60%	40	276	Rockwell B87 Max	0.285	7.889			
				301 1/4 Hard		Slightly if work hardened	125	862	25%	75	517	Rockwell C25-C30	0.285	7.889			
				301 1/2 Hard		Slightly if work hardened	150	1034	18%	110	758	Rockwell C30-C35	0.285	7.889			
				301 3/4 Hard		Slightly if work hardened	175	1207	12%	135	931	Rockwell C35-C40	0.285	7.889			
				301 Full Hard		Slightly if work hardened	185	1276	8%	140	965	Rockwell C40-C45	0.285	7.889			
302	302 is resistant to oxidation, easy to clean and fabricate, and offers high strength with low weight.	Passivation, Electro-polish	Utensils, cookware, and stainless flatware	302 Annealed		Slightly if work hardened	75	517	40%	30	207	Rockwell B87 Max	0.284	7.861			
				302 1/4 Hard		Slightly if work hardened	125	862	10%	75	517	Rockwell C25-C30	0.284	7.861			
				302 1/2 Hard		Slightly if work hardened	150	1034	9%	110	758	Rockwell C30-C35	0.284	7.861			
				302 3/4 Hard		Slightly if work hardened	165	1138	6%	125	862	Rockwell C35-C40	0.284	7.861			
				302 Full Hard		Slightly if work hardened	185	1276	3%	140	965	Rockwell C40-C45	0.284	7.861			
304	304 is resistant to food processing environments, withstands ordinary rusting in architecture, and resists dyestuffs, organic chemicals, and a variety of inorganic chemicals.	Passivation, Electro-polish	Sinks, appliances, chemical containers, food processing equipment	304 Annealed		Slightly if work hardened	75	517	40%	30	207	Rockwell B87 Max	0.289	7.999			
				304 1/4 Hard		Slightly if work hardened	125	862	10%	75	517	Rockwell C25-C30	0.289	7.999			
				304 1/2 Hard		Slightly if work hardened	150	1034	9%	110	758	Rockwell C30-C35	0.289	7.999			
				304 3/4 Hard		Slightly if work hardened	175	1207	8%	135	931	Rockwell C35-C40	0.289	7.999			
				304 Full Hard		Slightly if work hardened	185	1276	7%	140	965	Rockwell C40-C45	0.289	7.999			
316	316 contains more nickel than 304, offering better resistance to corrosion, especially in chloride environments that cause pitting. It has superior creep strength, close tolerances, good pitting resistance, and is easy to maintain.	Passivation, Electro-polish	Valve and pump parts, chemical processing equipment, tanks, jet engine parts, pharmaceutical components	316		Slightly if work hardened	75	517	40%	30	207	Rockwell B95 Max	0.289	7.999			
				316L		Slightly if work hardened	70	483	40%	25	172	Rockwell B95 Max	0.289	7.999			
				410 Annealed		Yes	65	448	20%	30	207	Rockwell B95 Max	0.276	7.640			
				410 Hardened		Yes	205	1413	8%	185	1276	Rockwell C40-C45	0.276	7.640			
				420 Annealed		Yes	95	655	25%	345	2379	Rockwell B96 Max	0.278	7.695			
420	420 is extremely durable, offers excellent corrosion resistance, and is hardenable to 500 B																