

## CTS Fasteners & Metals Report No. 87

### Summary of Chemical Analysis Results

Chemical Analysis Carbon & Low Alloy Steel  
 Material: AISI 4340 Steel  
 Sample ID: L79

Element	Grand Mean	B-L Std Dev	Two Std Dev Range		Three Std Dev Range	
Carbon	0.4220	0.0106	0.4008	- 0.4432	0.3902	- 0.4538
Manganese	0.7489	0.0091	0.7307	- 0.7671	0.7216	- 0.7762
Phosphorus	0.0080	0.0009	0.0062	- 0.0098	0.0053	- 0.0107
Sulfur	0.0022	0.0009	0.0004	- 0.0040	0.0000	- 0.0049
Silicon	0.2752	0.0070	0.2612	- 0.2892	0.2542	- 0.2962
Copper	0.0492	0.0023	0.0446	- 0.0538	0.0423	- 0.0561
Nickel	1.683	0.024	1.635	- 1.731	1.611	- 1.755
Chromium	0.8126	0.0126	0.7874	- 0.8378	0.7748	- 0.8504
Molybdenum	0.2643	0.0067	0.2509	- 0.2777	0.2442	- 0.2844
Aluminum	0.0301	0.0015	0.0271	- 0.0331	0.0256	- 0.0346

Material: AISI 4330 Steel  
 Sample ID: L80

Element	Grand Mean	B-L Std Dev	Two Std Dev Range		Three Std Dev Range	
Carbon	0.2998	0.0080	0.2838	- 0.3158	0.2758	- 0.3238
Manganese	1.0001	0.0129	0.9743	- 1.0259	0.9614	- 1.0388
Phosphorus	0.0056	0.0011	0.0034	- 0.0078	0.0023	- 0.0089
Sulfur	0.0016	0.0010	0.0000	- 0.0036	0.0000	- 0.0046
Silicon	0.2759	0.0071	0.2617	- 0.2901	0.2546	- 0.2972
Copper	0.0763	0.0031	0.0701	- 0.0825	0.0670	- 0.0856
Nickel	1.798	0.026	1.746	- 1.850	1.720	- 1.876
Chromium	0.9031	0.0145	0.8741	- 0.9321	0.8596	- 0.9466
Molybdenum	0.4032	0.0111	0.3810	- 0.4254	0.3699	- 0.4365
Aluminum	0.0450	0.0019	0.0412	- 0.0488	0.0393	- 0.0507

Statistics for samples L79 and L80 are based on the results of at least 113 labs.