



# Fasteners & Metals Testing Program

## Summary Report Cycle 113, 1st Quarter - 2016

Collaborative Testing Services, Inc.

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## ABOUT THE FASTENERS & METALS PROGRAM

Collaborative Testing Services operates and maintains the program for Fasteners and Metals as part of a series of Proficiency and Interlaboratory Testing Programs offered by CTS in cooperation with various associations for a wide range of industries. Personnel from the National Institute of Standards and Technology (formerly the National Bureau of Standards), Industrial Fasteners Institute (IFI), and the Naval Shipyard Laboratories provide technical guidance and advice to this program.

The purpose of the program is to give participating laboratories a means to compare periodically the level and uniformity of their testing with that of other laboratories in the industry. It also provides a realistic assessment of the state of fasteners and metals testing proficiency.

In each report, there is a summary of the statistics for the analysis and a graphical representation of the data for each test. Also shown are notes concerning specific laboratory results, as well as significant findings related to instrument types or other testing variations. Refer to the KEY TO TABLES AND GRAPHS for an explanation of terms and guidelines to interpreting the results.

## ABOUT CTS

Founded in 1971, CTS is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries, including rubber, plastics, fasteners and metals, containerboard, paper, color, and wine as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 50 countries, currently participate in the CTS programs.

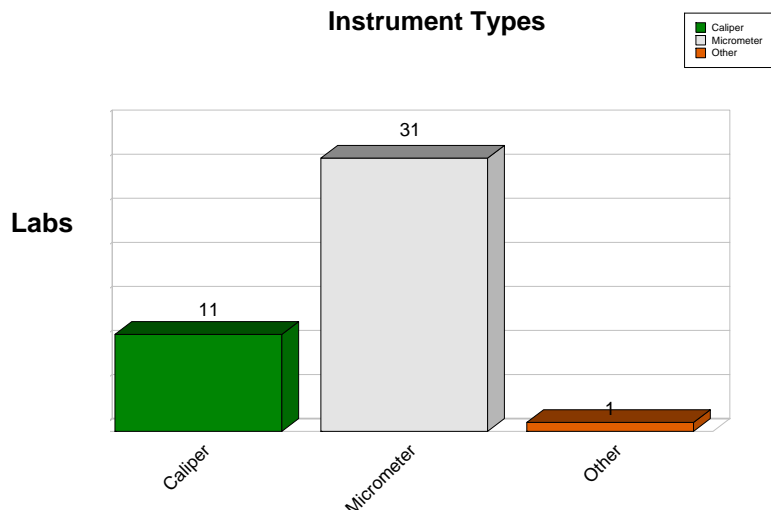
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Interlaboratory Testing Program for Metals  
Analysis 101  
Dimensional: Outside Diameter of Plain Plug Gage  
ISO GUM

During Cycle 113, CTS conducted the Analysis #101 - Round Dimensional. For this test all participants received two samples I33 and I34 with nominal diameters; 0.5000 in. and 0.4998 in. Each sample is an English Class X gage pin with 0.00002 in roundness limit made from 52100 bearing steel, hardened to 60-62 Rockwell C. Laboratories were asked to determine the outside diameter of the pins. 43 laboratories that subscribed for this test reported testing results. The graph below shows a breakdown of the types of instruments used.



### Analysis of the Results

The most convenient and common method of judging the quality of measurement results is by calculating the performance statistic,  $E_n$ , calculated as:

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Where the assigned value,  $X_{ref}$ , is determined in a reference laboratory,  $U_{ref}$  is the expanded uncertainty of  $X_{ref}$ , and  $U_{lab}$  is the **Expanded Uncertainty** of a participant's result,  $X_{lab}$ .  $E_n$  is not calculated for Labs who did not report their Expanded Uncertainty.

Absolute values of  $E_n$  less than **1.00** should be obtained for the measurements to be acceptable.

The following graph and the table represent the results reported by participants. All tests were conducted at room temperature (20-23C or 68-77F).

$X_{ref}$  and  $U_{ref}$  were determined by the gage pin manufacturer. The manufacturer is ISO 9001:2000 Certified and an ISO 17025 Accredited company. All master gages used in checking the plug gages are calibrated with standards traceable to NIST.

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Interlaboratory Testing Program for Metals  
Analysis 101  
Dimensional: Outside Diameter of Plain Plug Gage  
ISO GUM

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Xref1 = 0.5000 in.

Xref2 = 0.4998 in.

**Sample I33**

**Sample I34**

WebCode	Data Flag (if assigned)	Reference Uncertainty (Uref)	Expanded Uncertainty (Ulab)	Lab Mean (Xlab)	Performance Statistic (En1)	Lab Mean (Xlab)	Performance Statistic (En2)	Instrument
4H7JEG		0.00004	0.00500	0.50010	0.02	0.49970	-0.02	Micrometer
4UJL2Z		0.00004	0.00160	0.49950	-0.31	0.49950	-0.19	Caliper
4XXGFC		0.00004	0.00015	0.49990	-0.64	0.49974	-0.39	Micrometer
683NXX		0.00004	0.00030	0.49980	-0.66	0.49960	-0.66	Micrometer
69EMR7		0.00004	0.00100	0.50000	0.00	0.50000	0.20	Micrometer
6TKW7X	X	0.00004	0.00004	0.50000	0.01	0.49972	-1.41	Micrometer
79VUYA		0.00004	0.00104	0.50000	0.00	0.49950	-0.29	Caliper
88E8TE		0.00004	0.00030	0.50000	0.00	0.49980	0.00	Other
8X6X6L		0.00004	0.00020	0.49997	-0.15	0.49977	-0.15	Micrometer
9C4UA7		0.00004	0.00020	0.50002	0.08	0.49975	-0.26	Micrometer
BJBKG2		0.00004	0.00050	0.49950	-1.00	0.49950	-0.60	Caliper
CBFV9Q		0.00004	0.00090	0.50000	0.00	0.49960	-0.22	Caliper
CLXAMZ		0.00004	0.00600	0.49977	-0.04	0.49957	-0.04	Micrometer
DGLN3M		0.00004	0.00024	0.49997	-0.13	0.49970	-0.41	Micrometer
E3VH94	X	0.00004	0.00015	0.50000	0.00	0.49960	-1.29	Micrometer
EC2GLB	X	0.00004	0.00006	0.49994	-0.84	0.49964	-2.17	Micrometer
EEB96E		0.00004	0.00008	0.50003	0.36	0.49982	0.22	Micrometer
EU36DA		0.00004	0.00047	0.49982	-0.38	0.49960	-0.42	Micrometer
F2YK9M		0.00004	0.00020	0.49997	-0.16	0.49970	-0.49	Micrometer
FP3EEP		0.00004	0.00016	0.49998	-0.14	0.49970	-0.61	Micrometer
FQZNCZ		0.00004	0.00040	0.49998	-0.05	0.49972	-0.20	Micrometer
GG68Z2		0.00004	0.00039	0.49993	-0.18	0.49964	-0.41	Micrometer
GQFAL2		0.00004	0.00050	0.49990	-0.20	0.49962	-0.36	Micrometer
JX8KJG		0.00004	0.00159	0.50000	0.00	0.49950	-0.19	Caliper
K22V4T		0.00004	0.00016	0.50000	0.00	0.49972	-0.46	Micrometer
K88EFZ		0.00004	0.00020	0.49996	-0.20	0.49972	-0.39	Micrometer
LRTRAF		0.00004	0.00059	0.50013	0.22	0.49990	0.17	Micrometer
N4FERF		0.00004	Not Reported	0.50030		0.49910		Caliper
NDMCB4	X	0.00004	0.00020	0.49980	-0.98	0.49958	-1.08	Micrometer
NWVDC3	X	0.00004	0.00007	0.49984	-1.98	0.49960	-2.48	Micrometer
PGWVXN		0.00004	0.00300	0.50000	0.00	0.49960	-0.07	Caliper
PLTBTQ		0.00004	0.00100	0.50000	0.00	0.49900	-0.80	Caliper

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 101  
Dimensional: Outside Diameter of Plain Plug Gage  
ISO GUM

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Xref1 = 0.5000 in.

Xref2 = 0.4998 in.

**Sample I33**

**Sample I34**

WebCode	Data Flag (if assigned)	Reference Uncertainty (Uref)	Expanded Uncertainty (Ulab)	Lab Mean (Xlab)	Performance Statistic (En1)	Lab Mean (Xlab)	Performance Statistic (En2)	Instrument
PPD8DB	X	0.00004	0.00039	0.49953	-1.19	0.49929	-1.28	Caliper
PTF2FL		0.00004	0.00020	0.49985	-0.74	0.49965	-0.74	Micrometer
Q8RYXR	X	0.00004	0.00030	0.50044	1.45	0.49958	-0.73	Micrometer
TFBGX4		0.00004	0.00020	0.49992	-0.39	0.49973	-0.34	Micrometer
UDLC2Q		0.00004	0.00062	0.49950	-0.80	0.49950	-0.48	Caliper
VPTGRJ		0.00004	0.00049	0.50000	0.00	0.49978	-0.04	Micrometer
VURVE9		0.00004	Not Reported	0.50008		0.49980		Caliper
VYXN7J		0.00004	0.00023	0.49996	-0.17	0.49972	-0.32	Micrometer
WZNADE	X	0.00004	0.00005	0.49988	-1.87	0.49956	-3.75	Micrometer
XPKEVV	X	0.00004	0.00007	0.50000	0.00	0.49970	-1.24	Micrometer
YBFFJH		0.00004	0.00040	0.49999	-0.02	0.49963	-0.42	Micrometer

**Summary Statistics**

**Sample I33**

**Sample I34**

Reference Uncertainty = 0.00004 in.

Reference Diameters:

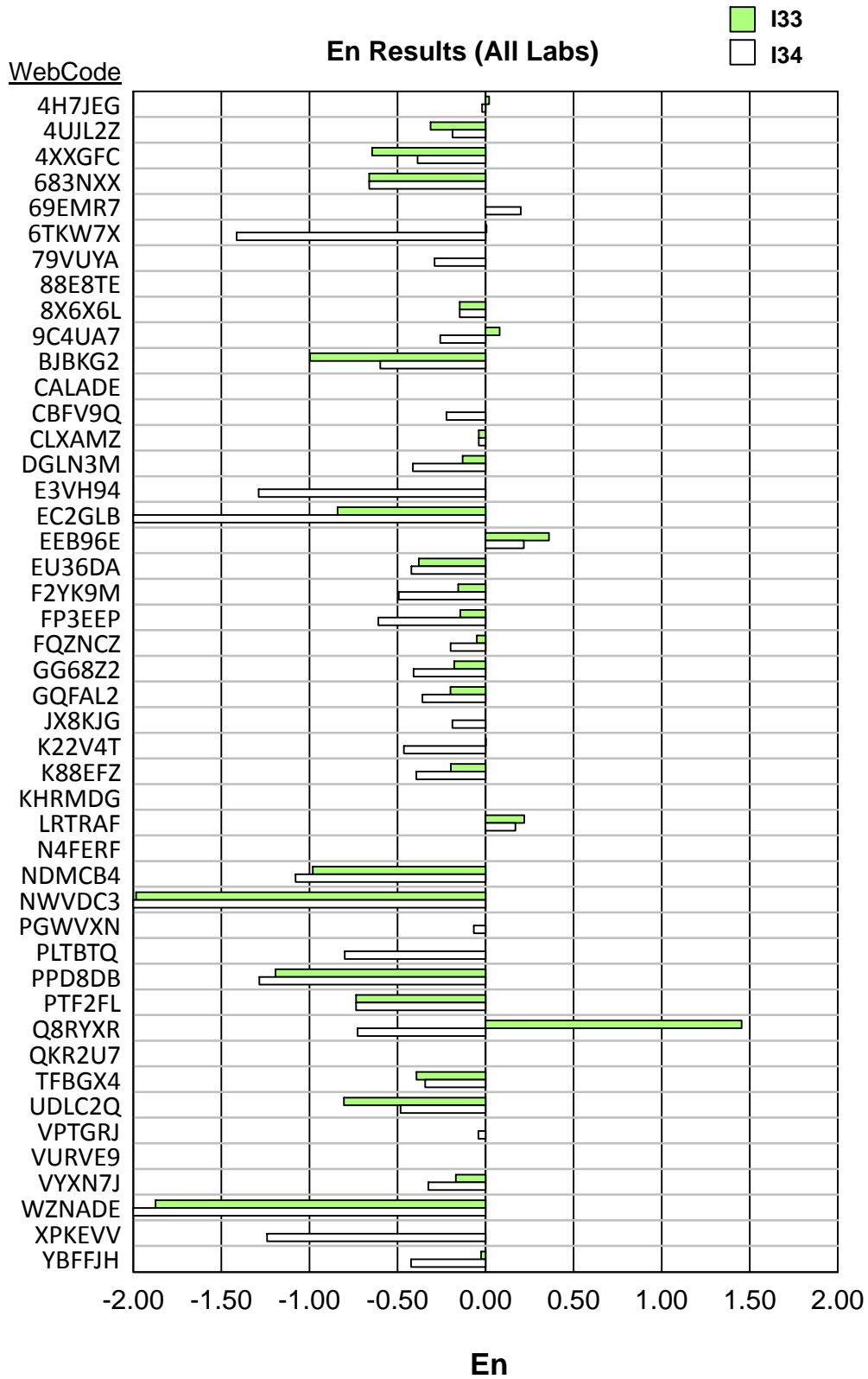
0.5000 inch

0.4998 inch

Samples I33 , I34 : 52100 steel

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 101  
Dimensional: Outside Diameter of Plain Plug Gage  
ISO GUM



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 105

Tensile Strength (Flat Aluminum) - ksi  
ASTM B557

WebCode	Data Flag	Sample R33			Sample R34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2WBYQL		47.70	-0.56	-1.19	48.00	-0.52	-1.12	ZZ
33WB3U		49.10	0.84	1.79	49.40	0.88	1.89	ZZ
449BRN		48.00	-0.26	-0.56	48.30	-0.22	-0.48	ZZ
64646L	*	48.40	0.14	0.30	49.40	0.88	1.89	ZZ
798VFG		47.70	-0.56	-1.19	48.00	-0.52	-1.12	ZZ
7HHX2G		47.70	-0.56	-1.19	48.10	-0.42	-0.91	ZZ
7Y6D4D		47.60	-0.66	-1.41	47.90	-0.62	-1.34	ZZ
88E8TE		48.50	0.24	0.51	48.80	0.28	0.60	ZZ
AYA3VF		48.66	0.40	0.85	48.53	0.01	0.02	ZZ
BAMNHL		47.90	-0.36	-0.77	48.00	-0.52	-1.12	ZZ
C4U4QB		47.80	-0.46	-0.98	48.20	-0.32	-0.69	ZZ
E8UTFC	X	49.70	1.44	3.07	45.50	-3.02	-6.50	ZZ
EC2GLB		48.30	0.04	0.08	48.44	-0.08	-0.17	ZZ
FPPNE7		47.80	-0.46	-0.98	48.30	-0.22	-0.48	ZZ
H74ZVG		48.72	0.46	0.98	49.07	0.54	1.17	ZZ
JF4URY		48.10	-0.16	-0.34	48.40	-0.12	-0.26	ZZ
JJ36NY	X	44.12	-4.14	-8.82	47.16	-1.36	-2.93	ZZ
JM7WRK	X	49.90	1.64	3.49	45.60	-2.92	-6.29	ZZ
N4WQ67		47.70	-0.56	-1.19	48.00	-0.52	-1.12	ZZ
NBWWAU		48.40	0.14	0.30	48.80	0.28	0.60	ZZ
NTVAHV		47.80	-0.46	-0.98	47.90	-0.62	-1.34	ZZ
PTF2FL		48.60	0.34	0.72	49.30	0.78	1.67	ZZ
R3VUHT		47.90	-0.36	-0.77	48.50	-0.02	-0.05	ZZ
RMD74N		48.60	0.34	0.72	48.50	-0.02	-0.05	ZZ
WE67MW	X	52.90	4.64	9.89	50.80	2.28	4.90	ZZ
WF3C9W		47.90	-0.36	-0.77	48.10	-0.42	-0.91	ZZ
WRH6P6		48.30	0.04	0.08	48.40	-0.12	-0.26	ZZ
WYJDCK		48.40	0.14	0.30	48.50	-0.02	-0.05	ZZ
WZP48T		49.31	1.05	2.23	49.45	0.92	1.99	ZZ
X2YC2Y		48.60	0.34	0.72	48.50	-0.02	-0.05	ZZ
XB3L8N		48.37	0.11	0.23	48.63	0.11	0.23	ZZ
XF3TTL		48.90	0.64	1.36	49.10	0.58	1.24	ZZ
YQYZ6W	X	61.00	12.74	27.15	60.50	11.98	25.77	ZZ
YV8HCR	X	51.48	3.21	6.85	51.63	3.11	6.69	ZZ
ZVM6AK		48.10	-0.16	-0.34	48.60	0.08	0.17	ZZ
ZWYZQX		48.96	0.70	1.49	48.56	0.03	0.07	ZZ

Summary Statistics

	Sample R33		Sample R34	
Grand Means	48.26	ksi	48.52	ksi
Std Dev Btwn Labs	0.47	ksi	0.46	ksi

Samples R33 , R34 : 6061-T6

Statistics based on 30 of 36 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 105  
Tensile Strength (Flat Aluminum) - ksi  
ASTM B557

**Comments on assigned Data Flags for Analysis #105**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>E8UTFC</b>	X	Data for sample R33 are high and data for sample R34 are low.
<b>JJ36NY</b>	X	Data for both samples are low. Possible Systematic error.
<b>JM7WRK</b>	X	Data for sample R33 are high and data for sample R34 are low.
<b>WE67MW</b>	X	Data for both samples are high. Possible Systematic error.
<b>YQYZ6W</b>	X	Data for both samples are high. Possible Systematic error.
<b>YV8HCR</b>	X	Data for both samples are high. Possible Systematic error.



Cycle 113  
1st Q, 2016

# Interlaboratory Testing Program for Metals

## Analysis 105

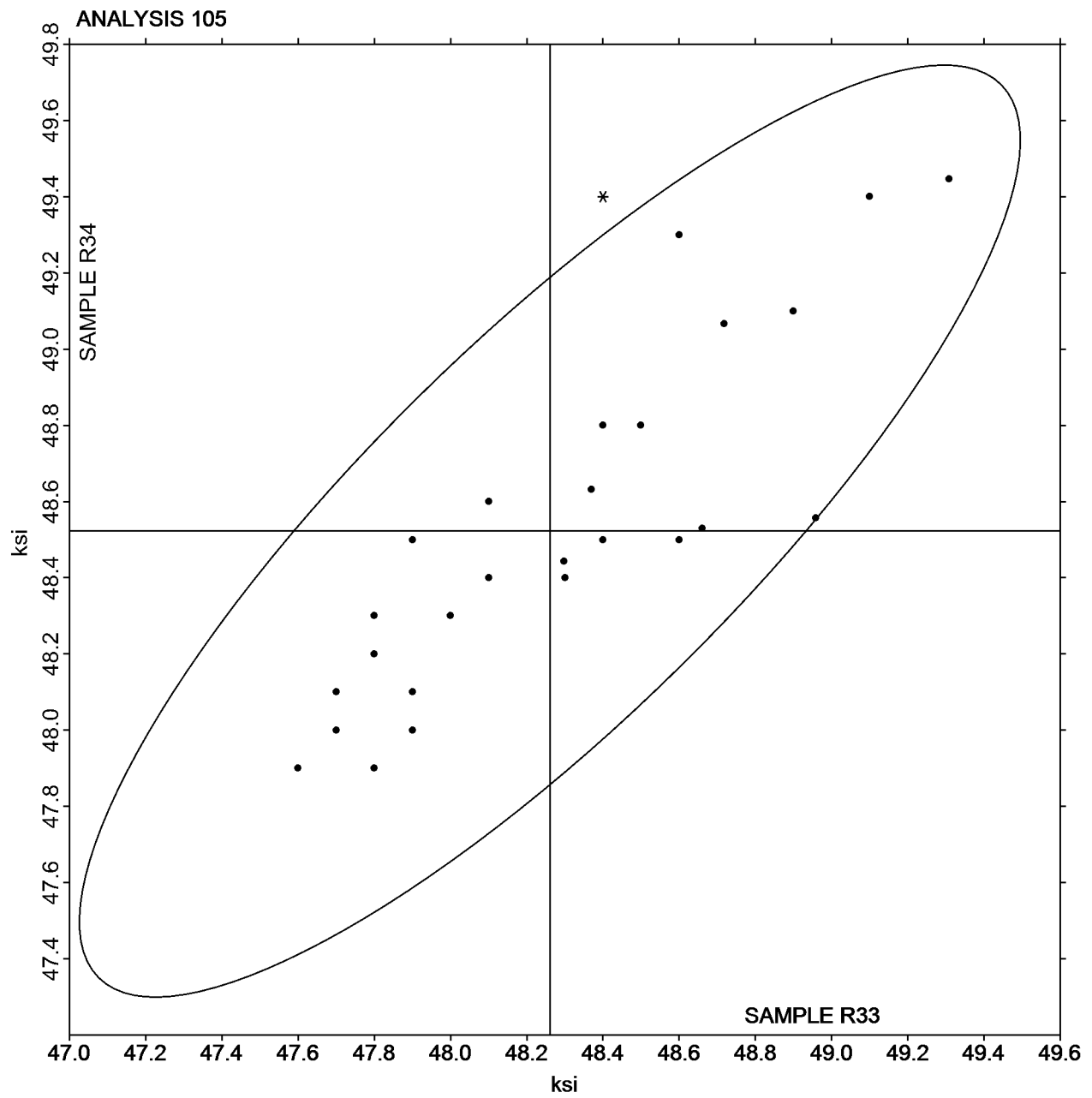
Tensile Strength (Flat Aluminum) - ksi  
ASTM B557

SAMPLE R33

48.26 ksi

SAMPLE R34

48.52 ksi



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 106

Yield Strength (Flat Aluminum) - ksi  
ASTM B557

WebCode	Data Flag	Sample R33			Sample R34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2WBYQL		40.40	-0.23	-0.47	40.30	-0.53	-1.26	ZZ
33WB3U		41.30	0.67	1.33	41.70	0.87	2.04	ZZ
449BRN		40.50	-0.13	-0.27	40.80	-0.03	-0.08	ZZ
64646L	X	40.20	-0.43	-0.87	41.70	0.87	2.04	ZZ
798VFG		40.30	-0.33	-0.67	40.50	-0.33	-0.79	ZZ
7HHX2G		40.20	-0.43	-0.87	40.50	-0.33	-0.79	ZZ
7Y6D4D		40.40	-0.23	-0.47	40.70	-0.13	-0.32	ZZ
88E8TE		40.90	0.27	0.53	41.00	0.17	0.39	ZZ
AYA3VF		41.08	0.44	0.88	40.90	0.07	0.16	ZZ
BAMNHL		40.30	-0.33	-0.67	40.60	-0.23	-0.55	ZZ
C4U4QB		40.20	-0.43	-0.87	40.50	-0.33	-0.79	ZZ
E8UTFC	X	41.60	0.97	1.93	38.30	-2.53	-5.98	ZZ
EC2GLB		40.76	0.12	0.24	40.90	0.07	0.16	ZZ
FPPNE7		40.20	-0.43	-0.87	40.90	0.07	0.15	ZZ
H74ZVG		41.13	0.50	1.00	41.47	0.63	1.49	ZZ
JF4URY		40.90	0.27	0.53	41.10	0.27	0.63	ZZ
JJ36NY	X	36.64	-3.99	-7.98	39.48	-1.36	-3.21	ZZ
JM7WRK	X	42.20	1.57	3.13	37.70	-3.13	-7.39	ZZ
N4WQ67		39.90	-0.73	-1.47	40.60	-0.23	-0.55	ZZ
NBWWAU		40.30	-0.33	-0.67	40.80	-0.03	-0.08	ZZ
NTVAHV		40.00	-0.63	-1.27	40.10	-0.73	-1.73	ZZ
PTF2FL		41.00	0.37	0.73	41.40	0.57	1.33	ZZ
R3VUHT		40.50	-0.13	-0.27	40.70	-0.13	-0.32	ZZ
RMD74N	*	41.30	0.67	1.33	40.80	-0.03	-0.08	ZZ
WCJG66		41.39	0.76	1.51	41.20	0.37	0.86	ZZ
WE67MW	X	45.10	4.47	8.93	43.40	2.57	6.05	ZZ
WF3C9W		40.30	-0.33	-0.67	40.70	-0.13	-0.32	ZZ
WRH6P6	*	39.40	-1.23	-2.47	39.70	-1.13	-2.67	ZZ
WYJDCK		41.00	0.37	0.73	40.90	0.07	0.15	ZZ
WZP48T	X	38.41	-2.22	-4.45	38.17	-2.66	-6.28	ZZ
X2YC2Y		41.30	0.67	1.33	41.40	0.57	1.33	ZZ
XB3L8N		41.02	0.38	0.76	41.19	0.36	0.84	ZZ
XF3TTL		41.10	0.47	0.93	41.10	0.27	0.63	ZZ
YQYZ6W	X	52.50	11.87	23.72	52.00	11.17	26.33	ZZ
YV8HCR	X	44.50	3.87	7.73	43.67	2.83	6.68	ZZ
ZVM6AK		40.70	0.07	0.13	40.90	0.07	0.15	ZZ
ZWYZQX	X	39.85	-0.79	-1.57	39.09	-1.75	-4.13	ZZ

Summary Statistics

	Sample R33		Sample R34	
Grand Means	40.63	ksi	40.83	ksi
Std Dev Btwn Labs	0.50	ksi	0.42	ksi

Samples R33 , R34 : 6061-T6

Statistics based on 28 of 37 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 106  
Yield Strength (Flat Aluminum) - ksi  
ASTM B557

**Comments on assigned Data Flags for Analysis #106**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
64646L	X	Inconsistent in testing between samples.
E8UTFC	X	Data for sample R34 are low. Inconsistent in testing between samples.
JJ36NY	X	Data for both samples are low. Possible Systematic error.
JM7WRK	X	Data for sample R33 are high and data for sample R34 are low.
WE67MW	X	Data for both samples are high. Possible Systematic error.
WZP48T	X	Data for both samples are low. Possible Systematic error.
YQYZ6W	X	Data for both samples are high. Possible Systematic error.
YV8HCR	X	Data for both samples are high. Possible Systematic error.
ZWYZQX	X	Data for sample R34 are low. Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

# Interlaboratory Testing Program for Metals

## Analysis 106

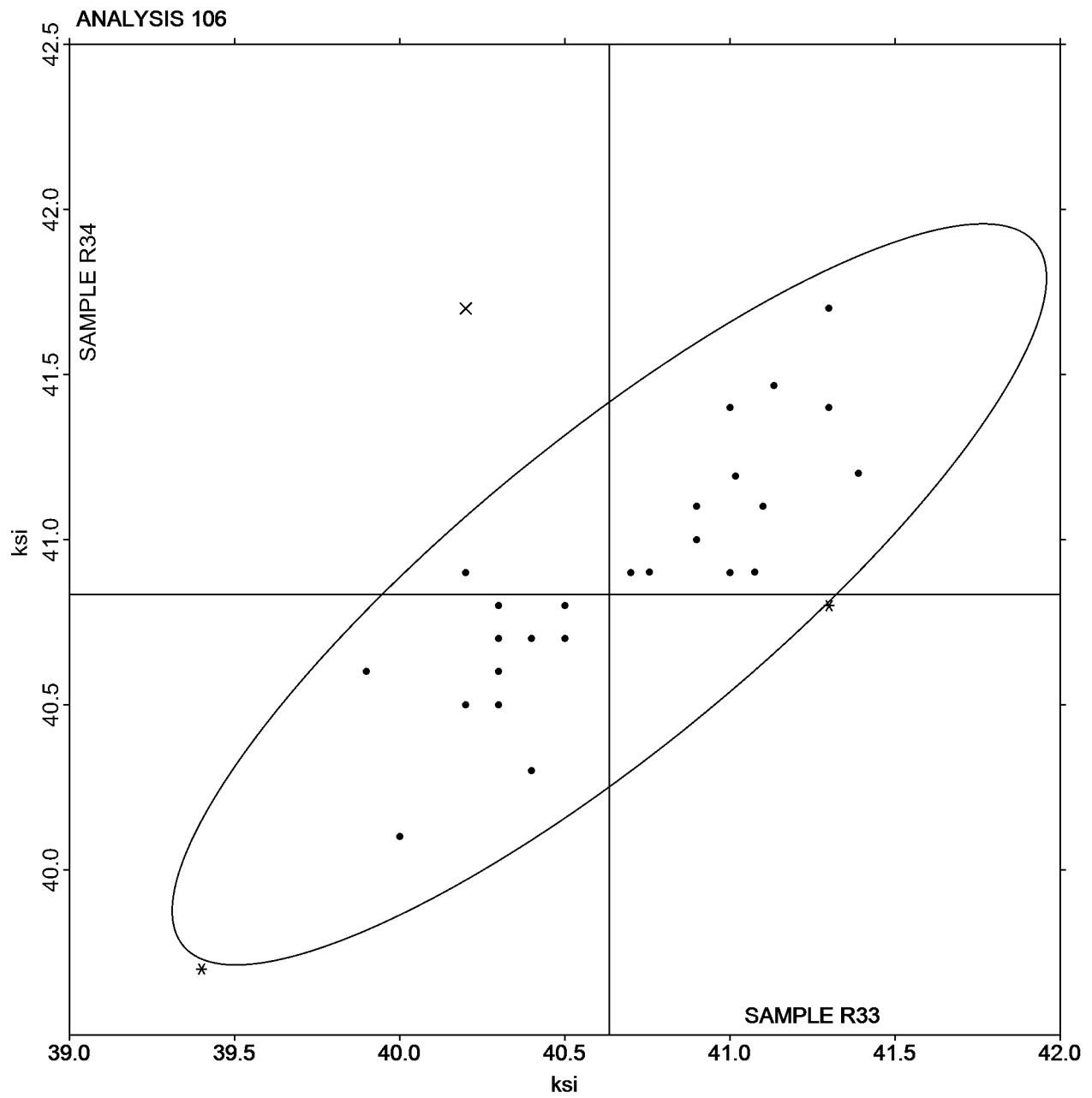
Yield Strength (Flat Aluminum) - ksi  
ASTM B557

SAMPLE R33

40.63 ksi

SAMPLE R34

40.83 ksi



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 107  
Elongation (Flat Aluminum) - Percent  
ASTM B557

WebCode	Data Flag	Sample R33			Sample R34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2WBYQL		13.90	-0.31	-0.30	15.50	0.67	0.65	ZZ
33WB3U		15.00	0.79	0.75	15.00	0.17	0.16	ZZ
449BRN		15.60	1.39	1.31	15.70	0.87	0.84	ZZ
64646L	*	17.00	2.79	2.64	16.95	2.12	2.05	ZZ
798VFG		14.10	-0.11	-0.11	14.90	0.07	0.07	ZZ
7HHX2G		13.80	-0.41	-0.39	15.10	0.27	0.26	ZZ
7Y6D4D		13.80	-0.41	-0.39	13.40	-1.43	-1.38	ZZ
88E8TE		15.00	0.79	0.75	15.00	0.17	0.16	ZZ
AYA3VF		13.20	-1.01	-0.96	13.80	-1.03	-1.00	ZZ
BAMNHL		13.30	-0.91	-0.86	13.50	-1.33	-1.29	ZZ
C4U4QB		14.00	-0.21	-0.20	14.80	-0.03	-0.03	ZZ
E8UTFC		13.10	-1.11	-1.05	13.30	-1.53	-1.48	ZZ
EC2GLB		14.70	0.49	0.46	15.70	0.87	0.84	ZZ
FPPNE7		13.50	-0.71	-0.67	13.50	-1.33	-1.29	ZZ
H74ZVG		12.50	-1.71	-1.62	13.10	-1.73	-1.67	ZZ
JF4URY		15.00	0.79	0.75	15.80	0.97	0.94	ZZ
JJ36NY		15.20	0.99	0.93	15.70	0.87	0.84	ZZ
JM7WRK		13.00	-1.21	-1.15	14.50	-0.33	-0.32	ZZ
N4WQ67		15.40	1.19	1.12	15.00	0.17	0.16	ZZ
NBWWAU		13.50	-0.71	-0.67	14.80	-0.03	-0.03	ZZ
NTVAHV		15.30	1.09	1.03	16.20	1.37	1.32	ZZ
PTF2FL		14.00	-0.21	-0.20	14.40	-0.43	-0.42	ZZ
R3VUHT		13.80	-0.41	-0.39	14.50	-0.33	-0.32	ZZ
RMD74N		14.60	0.39	0.37	15.60	0.77	0.74	ZZ
WCJG66		13.10	-1.11	-1.05	13.40	-1.43	-1.38	ZZ
WE67MW		13.90	-0.31	-0.30	14.00	-0.83	-0.80	ZZ
WF3C9W		13.40	-0.81	-0.77	13.10	-1.73	-1.67	ZZ
WRH6P6		12.50	-1.71	-1.62	14.00	-0.83	-0.80	ZZ
WYJDCK		14.50	0.29	0.27	15.00	0.17	0.16	ZZ
WZP48T		14.75	0.54	0.51	16.35	1.52	1.47	ZZ
X2YC2Y		14.50	0.29	0.27	14.50	-0.33	-0.32	ZZ
XB3L8N		13.42	-0.79	-0.75	14.46	-0.37	-0.36	ZZ
XF3TTL		14.00	-0.21	-0.20	15.00	0.17	0.16	ZZ
YQYZ6W		14.00	-0.21	-0.20	16.00	1.17	1.13	ZZ
YV8HCR		14.90	0.69	0.65	16.00	1.17	1.13	ZZ
ZVM6AK		13.50	-0.71	-0.67	14.50	-0.33	-0.32	ZZ
ZWYZQX	*	17.10	2.89	2.73	16.70	1.87	1.81	ZZ

Summary Statistics

	Sample R33		Sample R34	
Grand Means	14.21	Percent	14.83	Percent
Std Dev Btwn Labs	1.06	Percent	1.03	Percent

Samples R33 , R34 : 6061-T6

Statistics based on 37 of 37 reporting participants

Cycle 113  
1st Q, 2016

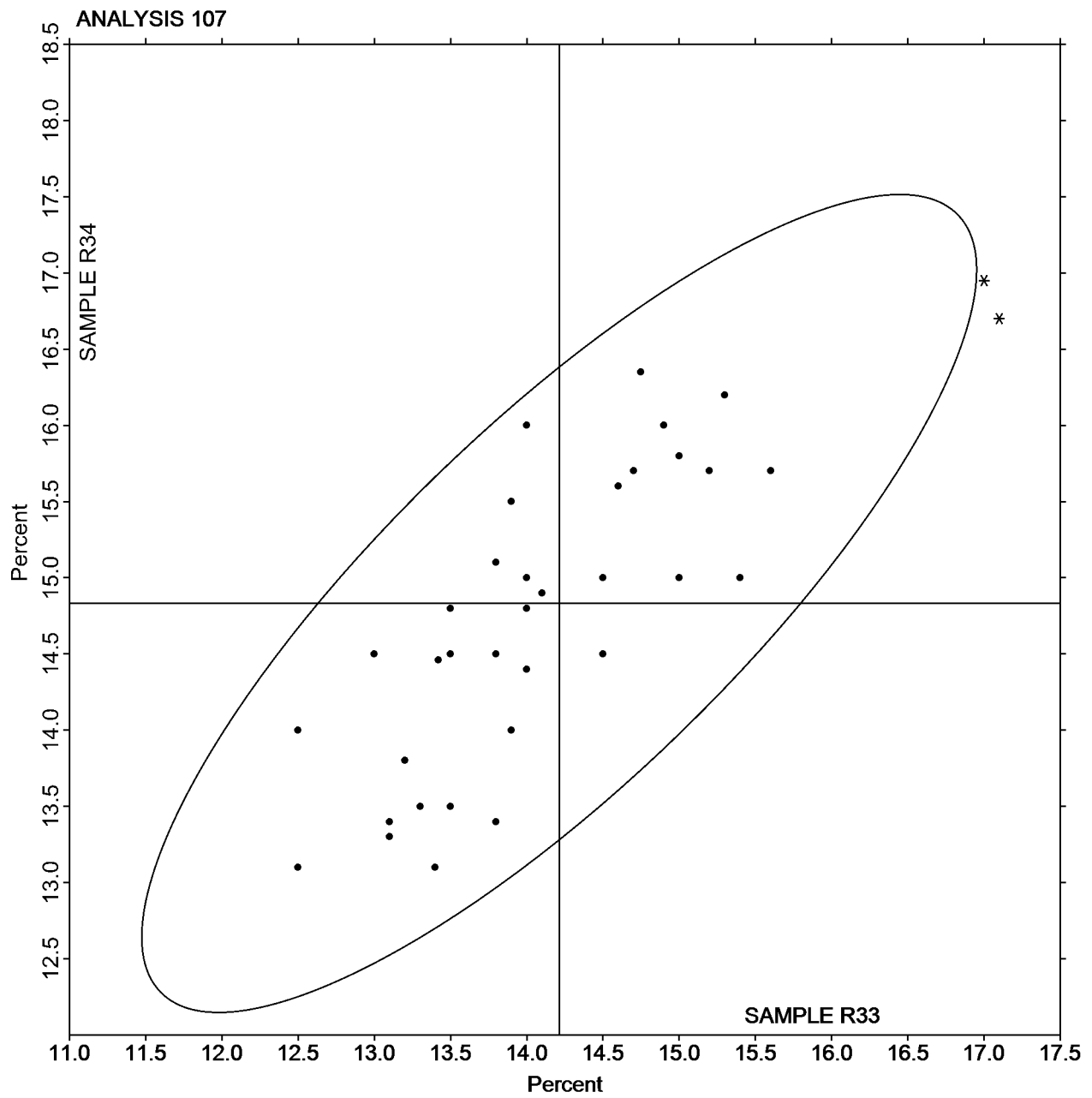
### Interlaboratory Testing Program for Metals

#### Analysis 107

Elongation (Flat Aluminum) - Percent  
ASTM B557

SAMPLE R33  
14.21 Percent

SAMPLE R34  
14.83 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 110  
Tensile Strength (Pre-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample A33			Sample A34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J		73.00	0.31	0.51	73.10	0.00	-0.01	ZZ
3UKC9H		72.40	-0.29	-0.49	72.90	-0.20	-0.36	ZZ
4NAJNY		73.39	0.70	1.16	72.95	-0.15	-0.26	ZZ
4VW7UB		73.00	0.31	0.51	73.50	0.40	0.70	ZZ
69CU8R		72.22	-0.47	-0.79	73.00	-0.10	-0.18	ZZ
736KPB	*	71.10	-1.59	-2.65	72.20	-0.90	-1.60	ZZ
7YJXLH	*	73.20	0.51	0.85	72.30	-0.80	-1.42	ZZ
A46VTG		72.81	0.12	0.20	73.39	0.29	0.51	ZZ
AJWRZT		73.27	0.58	0.96	73.80	0.70	1.23	ZZ
ATMD7Q		72.66	-0.03	-0.05	72.66	-0.44	-0.78	ZZ
B4ZV7L		73.00	0.31	0.51	73.00	-0.10	-0.18	ZZ
BH39UK		71.90	-0.79	-1.32	72.60	-0.50	-0.89	ZZ
CLXAMZ		71.90	-0.79	-1.32	72.30	-0.80	-1.42	ZZ
DRKJA3		72.40	-0.29	-0.49	72.70	-0.40	-0.72	ZZ
DU6FUM	M	72.04	-0.66	-1.09	No Data Reported			ZZ
DVJZBQ		72.08	-0.61	-1.01	72.81	-0.29	-0.52	ZZ
EYCJRF		72.50	-0.19	-0.32	73.60	0.50	0.88	ZZ
FGQC6U		73.15	0.46	0.76	73.37	0.27	0.47	ZZ
FVTQJ7		72.00	-0.69	-1.15	72.40	-0.70	-1.25	ZZ
GQFAL2		74.00	1.31	2.18	74.50	1.40	2.47	ZZ
H69GP9	X	70.80	-1.89	-3.16	70.77	-2.33	-4.13	ZZ
JQRLGC		71.94	-0.75	-1.25	73.10	0.00	-0.01	ZZ
JXQBXG	X	73.82	1.13	1.89	71.79	-1.31	-2.32	ZZ
KLQZYK		72.70	0.01	0.01	73.40	0.30	0.52	ZZ
MH384G		73.20	0.51	0.85	73.40	0.30	0.52	ZZ
MH6WAY		72.60	-0.09	-0.15	72.90	-0.20	-0.36	ZZ
MKN73X		72.70	0.01	0.01	73.00	-0.10	-0.18	ZZ
MXAMPA		72.50	-0.19	-0.32	72.80	-0.30	-0.54	ZZ
NVNX6W		72.30	-0.39	-0.65	73.10	0.00	-0.01	ZZ
P3ZGXU		72.70	0.01	0.01	73.10	0.00	-0.01	ZZ
QU6RR7		73.30	0.61	1.02	73.87	0.76	1.35	ZZ
RYR2E9		72.08	-0.61	-1.01	72.52	-0.58	-1.04	ZZ
RYVHLT		72.50	-0.19	-0.32	72.60	-0.50	-0.89	ZZ
UN3YCC		73.84	1.15	1.91	74.48	1.38	2.44	ZZ
UV4B9A		72.30	-0.39	-0.65	72.50	-0.60	-1.07	ZZ
UX88MX		72.93	0.24	0.40	73.84	0.74	1.30	ZZ
WUNL4N		73.00	0.31	0.51	73.10	0.00	-0.01	ZZ
YBXNAX		72.72	0.03	0.05	73.16	0.05	0.09	ZZ
ZPXLH		73.60	0.91	1.51	73.80	0.70	1.23	ZZ

Summary Statistics

	Sample A33		Sample A34	
Grand Means	72.69	ksi	73.10	ksi
Std Dev Btwn Labs	0.60	ksi	0.56	ksi

Samples A33 , A34 : AISI 4340

Statistics based on 36 of 39 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 110  
Tensile Strength (Pre-Machined Round Steel) - ksi  
ASTM E8

**Comments on assigned Data Flags for Analysis #110**

WebCode   Flag   Analyst Comment

**DU6FUM**   M   Laboratory did not submit data for sample A34.

**H69GP9**   X   Data for both samples are low. Possible Systematic error.

**JXQBXG**   X   Inconsistent in testing between samples.



Cycle 113  
1st Q, 2016

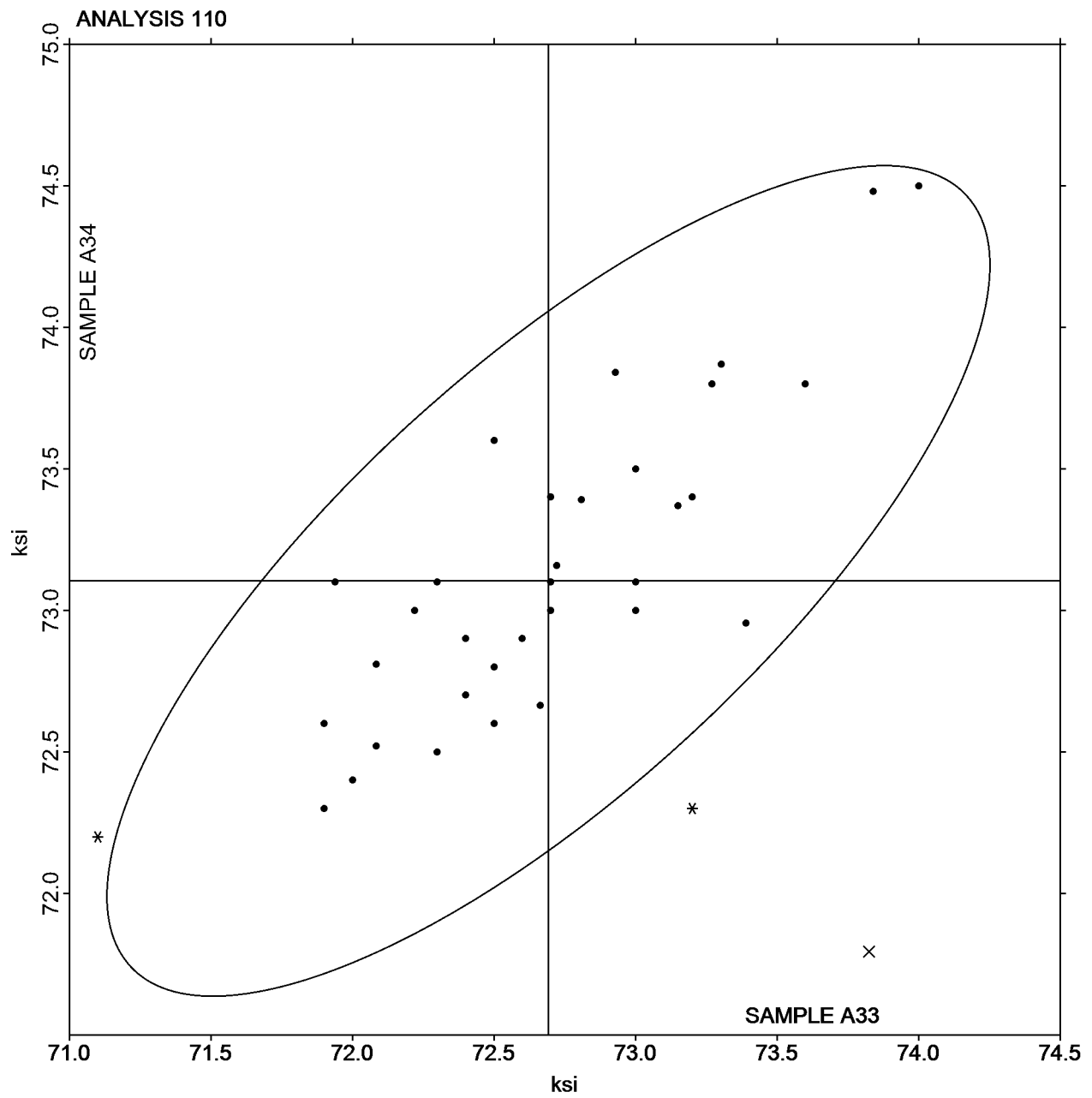
Interlaboratory Testing Program for Metals  
Analysis 110  
Tensile Strength (Pre-Machined Round Steel) - ksi  
ASTM E8

SAMPLE A33

72.69 ksi

SAMPLE A34

73.10 ksi



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 111  
Yield Strength (Pre-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample A33			Sample A34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J		50.50	2.14	0.69	48.40	0.58	0.18	ZZ
3UKC9H		44.60	-3.76	-1.22	44.70	-3.12	-0.98	ZZ
4NAJNY		53.08	4.72	1.53	50.62	2.80	0.87	ZZ
4VW7UB		47.80	-0.56	-0.18	47.00	-0.82	-0.26	ZZ
69CU8R		49.44	1.08	0.35	50.73	2.91	0.91	ZZ
736KPB		54.60	6.24	2.02	53.00	5.18	1.62	ZZ
A46VTG		48.44	0.08	0.03	51.20	3.38	1.05	ZZ
AJWRZT		47.17	-1.19	-0.38	47.93	0.11	0.03	ZZ
ATMD7Q		46.56	-1.80	-0.58	45.11	-2.72	-0.85	ZZ
B4ZV7L		49.00	0.64	0.21	47.00	-0.82	-0.26	ZZ
BH39UK		45.30	-3.06	-0.99	46.70	-1.12	-0.35	ZZ
CLXAMZ		45.20	-3.16	-1.02	44.60	-3.22	-1.01	ZZ
DRKJA3		52.10	3.74	1.21	51.70	3.88	1.21	ZZ
DU6FUM		44.68	-3.68	-1.19	46.12	-1.70	-0.53	ZZ
EYCJRF		45.20	-3.16	-1.02	44.50	-3.32	-1.04	ZZ
FGQC6U		45.72	-2.64	-0.85	45.75	-2.07	-0.65	ZZ
FVTQJ7		46.80	-1.56	-0.50	45.80	-2.02	-0.63	ZZ
GQFAL2		47.00	-1.36	-0.44	49.20	1.38	0.43	ZZ
H69GP9	*	43.72	-4.64	-1.50	38.55	-9.27	-2.90	ZZ
JQRLGC		51.49	3.13	1.01	48.73	0.91	0.28	ZZ
JXQBXG		45.83	-2.53	-0.82	44.24	-3.59	-1.12	ZZ
KLQZYK		52.00	3.64	1.18	49.10	1.28	0.40	ZZ
MH384G		51.10	2.74	0.89	46.70	-1.12	-0.35	ZZ
MH6WAY		44.40	-3.96	-1.28	44.60	-3.22	-1.01	ZZ
MKN73X		52.30	3.94	1.27	54.90	7.08	2.21	ZZ
MXAMPA		43.60	-4.76	-1.54	45.30	-2.52	-0.79	ZZ
NVNX6W		50.30	1.94	0.63	51.00	3.18	0.99	ZZ
P3ZGXU		49.77	1.41	0.46	49.65	1.83	0.57	ZZ
QU6RR7		46.69	-1.67	-0.54	46.44	-1.38	-0.43	ZZ
RYR2E9		44.24	-4.12	-1.33	43.95	-3.88	-1.21	ZZ
RYVHLT		51.20	2.84	0.92	51.20	3.38	1.05	ZZ
UN3YCC		48.95	0.59	0.19	49.45	1.63	0.51	ZZ
UV4B9A		50.30	1.94	0.63	52.10	4.28	1.34	ZZ
WUNL4N		53.60	5.24	1.69	49.00	1.18	0.37	ZZ
YBXNAX		50.01	1.65	0.53	48.78	0.95	0.30	ZZ
ZPXLEH		48.30	-0.06	-0.02	47.90	0.08	0.02	ZZ

Summary Statistics

	Sample A33		Sample A34	
Grand Means	48.36	ksi	47.82	ksi
Std Dev Btwn Labs	3.09	ksi	3.20	ksi

Samples A33 , A34 : AISI 4340

Statistics based on 36 of 36 reporting participants

Cycle 113  
1st Q, 2016

# Interlaboratory Testing Program for Metals

## Analysis 111

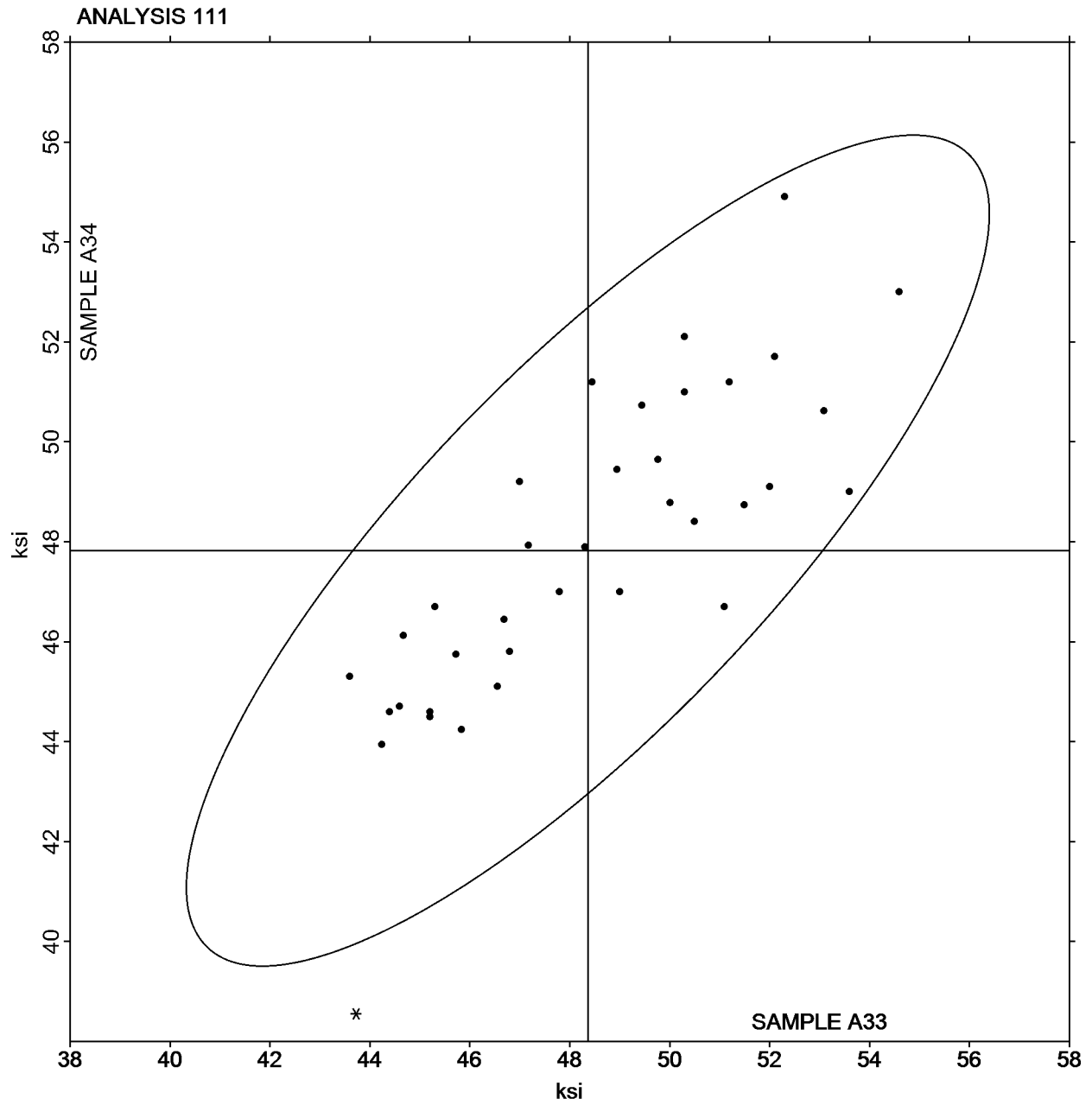
Yield Strength (Pre-Machined Round Steel) - ksi  
ASTM E8

SAMPLE A33

48.36 ksi

SAMPLE A34

47.82 ksi



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 112

Elongation - (Pre-Machined Round Steel) - Percent Increase  
ASTM E8

WebCode	Data Flag	Sample A33			Sample A34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J		32.00	-0.97	-0.77	32.00	-0.21	-0.22	ZZ
3UKC9H		33.60	0.63	0.50	33.20	0.99	1.06	ZZ
4NAJNY		32.20	-0.77	-0.61	31.70	-0.51	-0.54	ZZ
4VW7UB		33.30	0.33	0.26	32.10	-0.11	-0.11	ZZ
69CU8R		32.50	-0.47	-0.37	31.00	-1.21	-1.28	ZZ
736KPB	*	36.10	3.13	2.48	32.90	0.69	0.74	ZZ
A46VTG		32.50	-0.47	-0.37	31.50	-0.71	-0.75	ZZ
AJWRZT		32.00	-0.97	-0.77	32.00	-0.21	-0.22	ZZ
ATMD7Q		32.40	-0.57	-0.45	30.70	-1.51	-1.60	ZZ
B4ZV7L		32.00	-0.97	-0.77	32.00	-0.21	-0.22	ZZ
BH39UK		34.00	1.03	0.82	34.00	1.79	1.90	ZZ
CLXAMZ		33.50	0.53	0.42	32.20	-0.01	-0.01	ZZ
DRKJA3		32.00	-0.97	-0.77	32.00	-0.21	-0.22	ZZ
DU6FUM	M	33.00	0.03	0.02	No Data Reported			ZZ
EYCJRF	X	29.40	-3.57	-2.82	28.20	-4.01	-4.25	ZZ
FGQC6U		32.00	-0.97	-0.77	31.50	-0.71	-0.75	ZZ
FVTQJ7		34.80	1.83	1.45	34.60	2.39	2.54	ZZ
GQFAL2	*	36.70	3.73	2.95	35.00	2.79	2.96	ZZ
H69GP9		35.30	2.33	1.84	32.50	0.29	0.31	ZZ
JQRLGC		34.30	1.33	1.05	32.40	0.19	0.21	ZZ
JXQBXG		31.70	-1.27	-1.00	32.60	0.39	0.42	ZZ
KLQZYK		32.00	-0.97	-0.77	31.00	-1.21	-1.28	ZZ
MH384G		33.00	0.03	0.02	31.30	-0.91	-0.96	ZZ
MH6WAY		31.90	-1.07	-0.85	31.40	-0.81	-0.85	ZZ
MKN73X		32.50	-0.47	-0.37	32.50	0.29	0.31	ZZ
MXAMPA		32.70	-0.27	-0.21	32.30	0.09	0.10	ZZ
NVNX6W		32.60	-0.37	-0.29	31.90	-0.31	-0.32	ZZ
P3ZGXU		33.00	0.03	0.02	32.10	-0.11	-0.11	ZZ
QU6RR7		33.05	0.08	0.06	32.08	-0.13	-0.13	ZZ
RYR2E9		31.00	-1.97	-1.56	31.30	-0.91	-0.96	ZZ
RYVHLT		32.40	-0.57	-0.45	32.40	0.19	0.21	ZZ
UN3YCC		32.50	-0.47	-0.37	31.80	-0.41	-0.43	ZZ
UV4B9A		33.60	0.63	0.50	32.20	-0.01	-0.01	ZZ
WUNL4N		32.20	-0.77	-0.61	32.10	-0.11	-0.11	ZZ
YBXNAX		32.10	-0.87	-0.69	31.50	-0.71	-0.75	ZZ
ZPXLEH		33.50	0.53	0.42	33.20	0.99	1.06	ZZ

Summary Statistics

	Sample A33		Sample A34	
Grand Means	32.97	Percent	32.21	Percent
Std Dev Btwn Labs	1.26	Percent	0.94	Percent

Samples A33 , A34 : AISI 4340

Statistics based on 34 of 36 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 112  
Elongation - (Pre-Machined Round Steel) - Percent Increase  
ASTM E8

**Comments on assigned Data Flags for Analysis #112**

WebCode   Flag   Analyst Comment

**DU6FUM**   M   Laboratory did not submit data for sample A34.

**EYCJRF**   X   Data for both samples are low.

Cycle 113  
1st Q, 2016

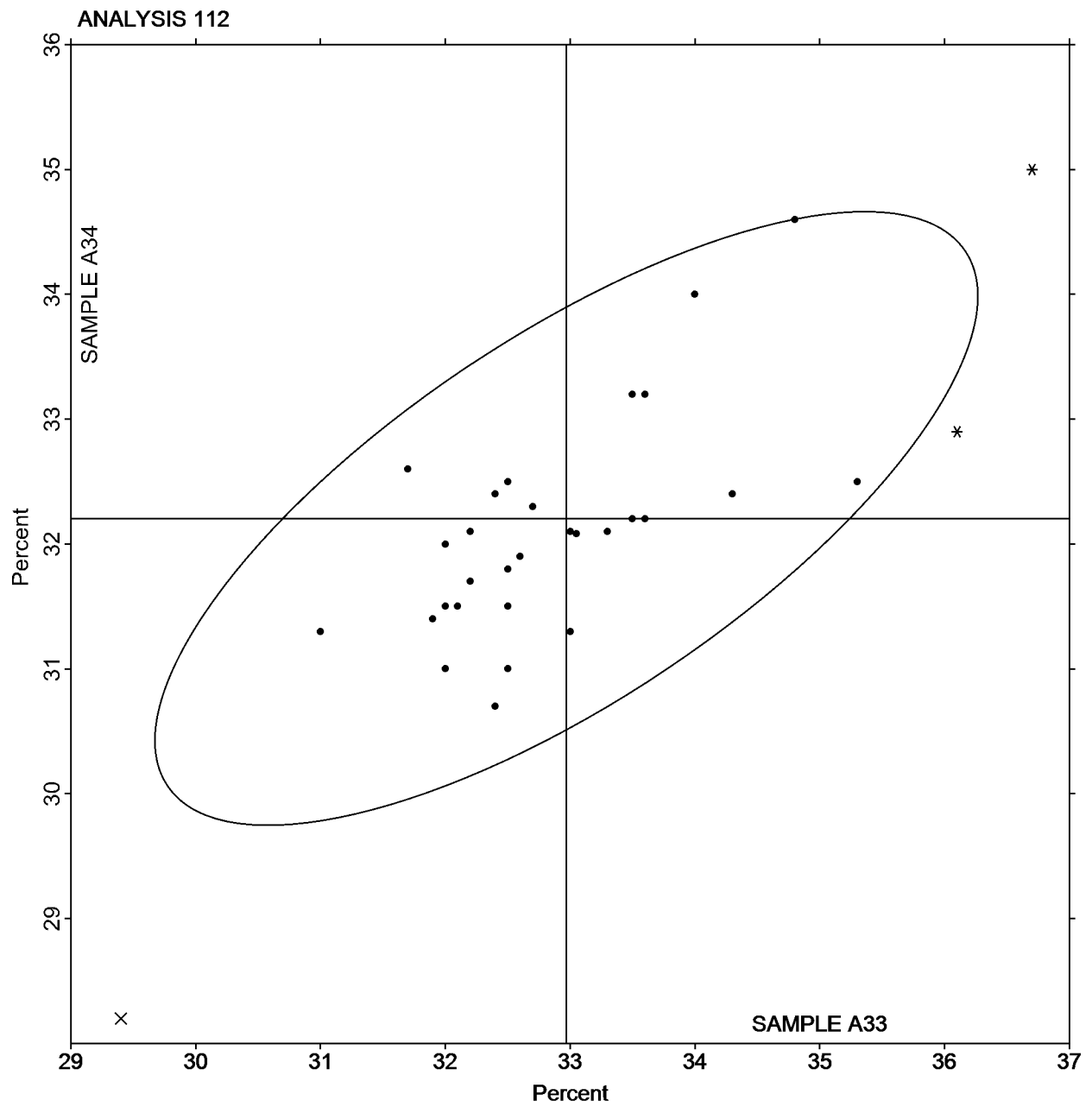
### Interlaboratory Testing Program for Metals

#### Analysis 112

Elongation - (Pre-Machined Round Steel) - Percent Increase  
ASTM E8

SAMPLE A33  
32.97 Percent

SAMPLE A34  
32.21 Percent



Cycle 113  
1st Q, 2016

**Interlaboratory Testing Program for Metals**  
**Analysis 113**  
Reduction of Area (Pre-Machined Round Steel) - Percent  
ASTM E8

WebCode	Data Flag	<b>Sample A33</b>			<b>Sample A34</b>			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J		65.00	-1.04	-1.11	65.00	-0.21	-0.26	ZZ
3UKC9H		64.40	-1.64	-1.75	65.60	0.39	0.49	ZZ
4NAJNY		66.90	0.86	0.92	66.70	1.49	1.88	ZZ
4VW7UB		65.40	-0.64	-0.68	65.20	-0.01	-0.01	ZZ
69CU8R		65.50	-0.54	-0.58	65.70	0.49	0.62	ZZ
736KPB		65.90	-0.14	-0.15	63.80	-1.41	-1.78	ZZ
A46VTG		65.00	-1.04	-1.11	64.00	-1.21	-1.53	ZZ
AJWRZT		66.00	-0.04	-0.04	64.00	-1.21	-1.53	ZZ
ATMD7Q		66.50	0.46	0.49	64.70	-0.51	-0.64	ZZ
B4ZV7L		67.00	0.96	1.02	66.00	0.79	1.00	ZZ
BH39UK		66.00	-0.04	-0.04	66.00	0.79	1.00	ZZ
CLXAMZ		64.70	-1.34	-1.43	64.90	-0.31	-0.39	ZZ
DRKJA3		67.00	0.96	1.02	65.60	0.39	0.49	ZZ
DU6FUM	M	67.00	0.96	1.02	No Data Reported			ZZ
EYCJRF		65.30	-0.74	-0.79	64.80	-0.41	-0.52	ZZ
FGQC6U		67.30	1.26	1.34	65.80	0.59	0.75	ZZ
FVTQJ7		67.90	1.86	1.99	66.00	0.79	1.00	ZZ
GQFAL2		68.00	1.96	2.09	66.00	0.79	1.00	ZZ
H69GP9		66.30	0.26	0.28	66.10	0.89	1.13	ZZ
JQRLGC		66.00	-0.04	-0.04	66.00	0.79	1.00	ZZ
JXQBXG		65.00	-1.04	-1.11	66.00	0.79	1.00	ZZ
KLQZYK		66.50	0.46	0.49	65.00	-0.21	-0.26	ZZ
MH384G		66.00	-0.04	-0.04	64.30	-0.91	-1.15	ZZ
MH6WAY		66.00	-0.04	-0.04	65.70	0.49	0.62	ZZ
MKN73X		66.10	0.06	0.06	64.70	-0.51	-0.64	ZZ
MXAMPA		66.30	0.26	0.28	64.90	-0.31	-0.39	ZZ
NVNX6W		67.00	0.96	1.02	65.00	-0.21	-0.26	ZZ
P3ZGXU		65.40	-0.64	-0.68	65.40	0.19	0.24	ZZ
QU6RR7		64.00	-2.04	-2.18	64.20	-1.01	-1.27	ZZ
RYR2E9		66.20	0.16	0.17	65.80	0.59	0.75	ZZ
RYVHLT		66.70	0.66	0.70	65.80	0.59	0.75	ZZ
UN3YCC		66.40	0.36	0.38	64.40	-0.81	-1.02	ZZ
UV4B9A		67.00	0.96	1.02	66.30	1.09	1.38	ZZ
WUNL4N		66.30	0.26	0.28	63.70	-1.51	-1.91	ZZ
YBXNAX		65.60	-0.44	-0.47	64.70	-0.51	-0.64	ZZ
ZPXLEH		64.80	-1.24	-1.32	64.50	-0.71	-0.90	ZZ

**Summary Statistics**

	<b>Sample A33</b>		<b>Sample A34</b>	
Grand Means	66.04	Percent	65.21	Percent
Std Dev Btwn Labs	0.94	Percent	0.79	Percent

Samples A33 , A34 : AISI 4340

Statistics based on 35 of 36 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 113  
Reduction of Area (Pre-Machined Round Steel) - Percent  
ASTM E8

**Comments on assigned Data Flags for Analysis #113**

WebCode   Flag   Analyst Comment

**DU6FUM**   M   Laboratory did not submit data for sample A34.

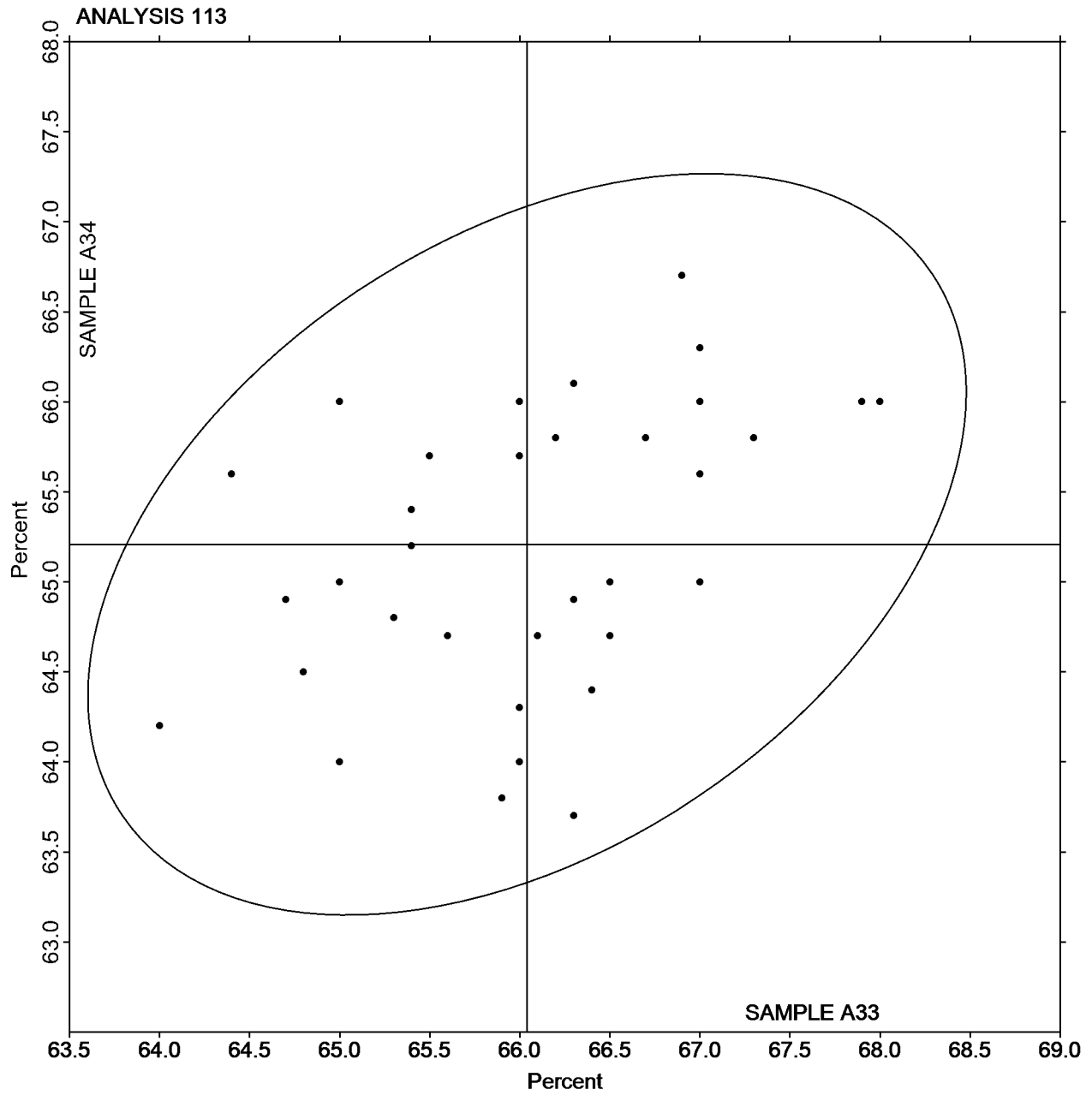


Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 113  
Reduction of Area (Pre-Machined Round Steel) - Percent  
ASTM E8

SAMPLE A33  
66.04 Percent

SAMPLE A34  
65.21 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 119

Rockwell Hardness (B Scale) - HRB  
ASTM E18

WebCode	Data Flag	Sample N33			Sample N34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3UKC9H		90.02	-0.14	-0.24	94.14	-0.04	-0.08	ZZ
3WUZ44		90.80	0.64	1.15	94.90	0.72	1.32	ZZ
488NKT		90.68	0.52	0.93	95.28	1.10	2.02	ZZ
4XXGFC		89.74	-0.42	-0.74	93.64	-0.54	-0.99	ZZ
74FJL6		91.08	0.92	1.65	94.34	0.16	0.29	ZZ
8ALF76		89.98	-0.18	-0.32	94.26	0.08	0.14	ZZ
8G6NNB		90.61	0.46	0.81	94.01	-0.17	-0.31	ZZ
9CZC6F		90.28	0.12	0.22	93.98	-0.20	-0.37	ZZ
9F4ADM		89.50	-0.66	-1.17	94.26	0.08	0.14	ZZ
A7BERC		90.20	0.04	0.08	94.14	-0.04	-0.08	ZZ
AJH6UK		90.37	0.22	0.38	94.07	-0.11	-0.20	ZZ
ARC949		89.52	-0.64	-1.14	93.32	-0.86	-1.58	ZZ
B4ZV7L		90.14	-0.02	-0.03	94.18	0.00	0.00	ZZ
B6VE8M		90.14	-0.02	-0.03	94.20	0.02	0.03	ZZ
CHWA4U		90.54	0.38	0.68	94.74	0.56	1.02	ZZ
CPXKHZ		89.10	-1.06	-1.89	93.26	-0.92	-1.69	ZZ
DPVF8B		89.66	-0.50	-0.89	94.58	0.40	0.73	ZZ
DVJZBQ	*	89.02	-1.14	-2.03	92.62	-1.56	-2.87	ZZ
DWDL4G		90.54	0.38	0.68	94.32	0.14	0.25	ZZ
EVBGTQ		90.58	0.42	0.76	94.04	-0.14	-0.26	ZZ
FAULFD		91.16	1.00	1.79	95.12	0.94	1.72	ZZ
FFX72X		90.26	0.10	0.18	93.92	-0.26	-0.48	ZZ
FGQC6U		89.78	-0.38	-0.67	93.78	-0.40	-0.74	ZZ
FQZNCZ		90.20	0.04	0.08	94.20	0.02	0.03	ZZ
FV9A44		91.20	1.04	1.86	95.16	0.98	1.80	ZZ
G8KWQA		90.42	0.26	0.47	94.44	0.26	0.47	ZZ
H36JUT		89.86	-0.30	-0.53	93.72	-0.46	-0.85	ZZ
JF4URY		89.10	-1.06	-1.89	93.54	-0.64	-1.18	ZZ
JKYNPZ		90.42	0.26	0.47	94.70	0.52	0.95	ZZ
JM7WRK	*	89.00	-1.16	-2.07	94.00	-0.18	-0.33	ZZ
KLQZYK		90.32	0.16	0.29	94.80	0.62	1.13	ZZ
KQZCLY		91.03	0.87	1.56	94.52	0.34	0.62	ZZ
LCZYRA	X	91.20	1.04	1.86	96.00	1.82	3.34	ZZ
LHLR8F		90.18	0.02	0.04	94.12	-0.06	-0.11	ZZ
LLMVNU		89.86	-0.30	-0.53	94.18	0.00	0.00	ZZ
LZK3LV		90.00	-0.16	-0.28	93.86	-0.32	-0.59	ZZ
M2VAHW		89.60	-0.56	-0.99	93.68	-0.50	-0.92	ZZ
MMEBN6	X	88.22	-1.94	-3.46	93.46	-0.72	-1.32	ZZ
NJUHFV		90.18	0.02	0.04	95.00	0.82	1.50	ZZ
NMUXMX		89.24	-0.92	-1.64	93.86	-0.32	-0.59	ZZ
NURGAM		89.36	-0.80	-1.42	93.58	-0.60	-1.10	ZZ
NVNX6W		90.48	0.32	0.58	94.04	-0.14	-0.26	ZZ
PLTBTQ		89.68	-0.48	-0.85	93.60	-0.58	-1.07	ZZ
PNZVBY		90.86	0.71	1.26	94.53	0.35	0.65	ZZ
QDDWКУ		90.84	0.68	1.22	95.22	1.04	1.91	ZZ
QNENMT		89.94	-0.22	-0.39	93.42	-0.76	-1.40	ZZ
QVFUD6		90.72	0.56	1.01	95.00	0.82	1.50	ZZ
RYVHLT		89.62	-0.54	-0.96	94.02	-0.16	-0.30	ZZ
T2HK6L		89.80	-0.36	-0.64	93.76	-0.42	-0.77	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 119  
Rockwell Hardness (B Scale) - HRB  
ASTM E18

WebCode	Data Flag	Sample N33			Sample N34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
T7NJ46		91.32	1.16	2.08	94.86	0.68	1.24	ZZ
T9CPXM		90.50	0.34	0.61	94.38	0.20	0.36	ZZ
TPLHJ6		90.02	-0.14	-0.24	93.96	-0.22	-0.41	ZZ
U8HHTG		90.70	0.54	0.97	94.66	0.48	0.88	ZZ
U9U6HH		89.60	-0.56	-0.99	93.88	-0.30	-0.55	ZZ
UV4B9A		89.80	-0.36	-0.64	93.68	-0.50	-0.92	ZZ
VJ6WN3		90.02	-0.14	-0.24	94.14	-0.04	-0.08	ZZ
VWWELG		90.18	0.02	0.04	94.22	0.04	0.07	ZZ
XDP79L		90.18	0.02	0.04	94.00	-0.18	-0.33	ZZ
YHJFTZ		90.80	0.64	1.15	94.94	0.76	1.39	ZZ
YT3VPZ	X	88.12	-2.04	-3.64	92.88	-1.30	-2.39	ZZ
Z3LQDT		90.36	0.20	0.36	94.74	0.56	1.02	ZZ
ZPXLH		89.92	-0.24	-0.42	93.34	-0.84	-1.54	ZZ
ZR2HGX		90.40	0.24	0.43	94.04	-0.14	-0.26	ZZ

Summary Statistics				
	Sample N33		Sample N34	
Grand Means	90.16	HRB	94.18	HRB
Std Dev Btwn Labs	0.56	HRB	0.54	HRB

Samples N33 , N34 : Steel

Statistics based on 60 of 63 reporting participants

**Comments on assigned Data Flags for Analysis #119**

WebCode   Flag   Analyst Comment

**LCZYRA**   X   Data for sample N34 are high. Inconsistent in testing between samples.

**MMEBN6**   X   Data for sample N33 are low. Inconsistent in testing between samples.

**YT3VPZ**   X   Data for sample N33 are low. Inconsistent in testing between samples. Inconsistent within the determinations of sample N33.

Cycle 113  
1st Q, 2016

# Interlaboratory Testing Program for Metals

## Analysis 119

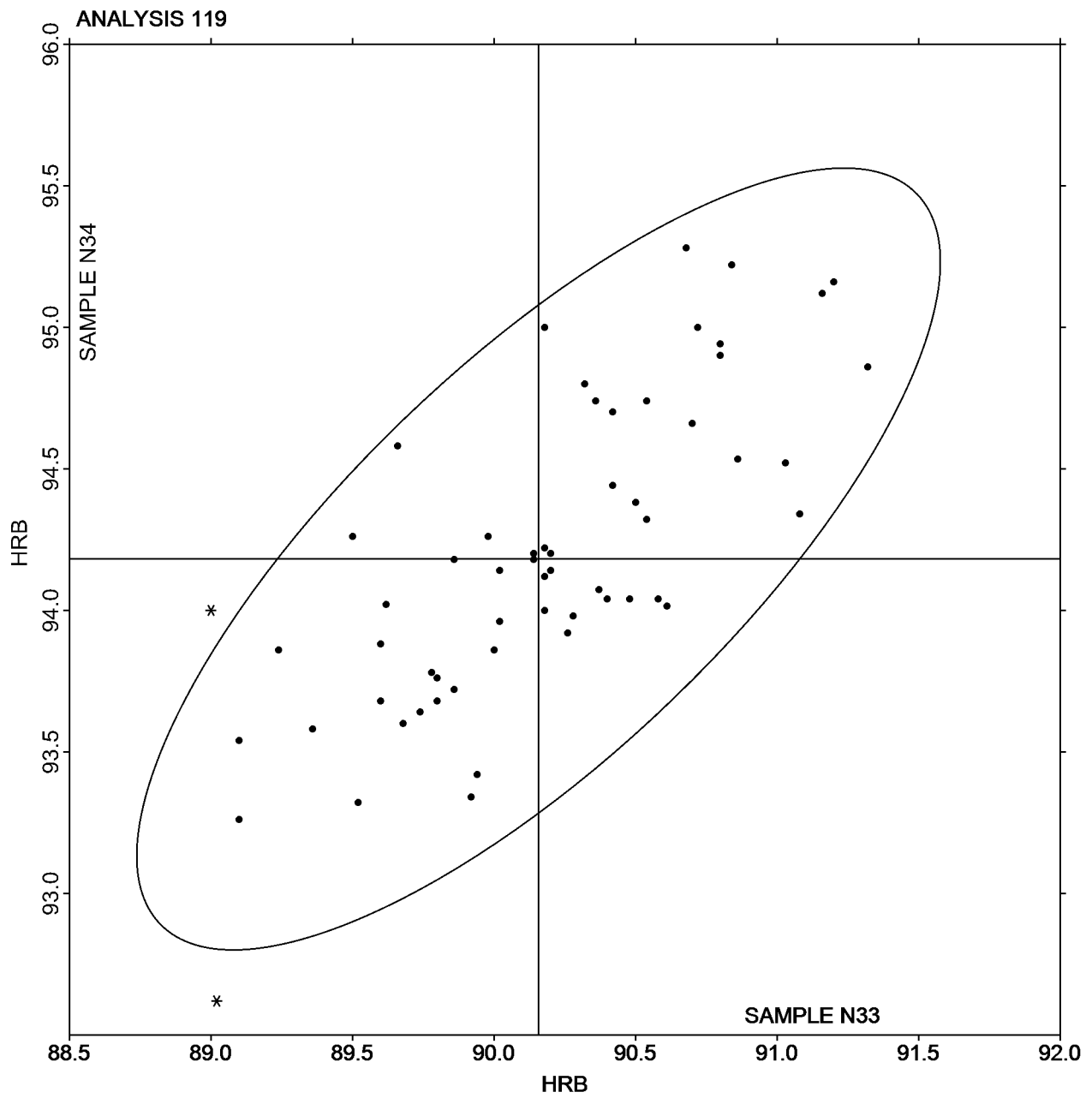
Rockwell Hardness (B Scale) - HRB  
ASTM E18

SAMPLE N33

90.16 HRB

SAMPLE N34

94.18 HRB



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 121  
Microhardness - Knoop Hardness Number (500 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J	*	495.40	29.80	2.33	514.60	10.63	0.76	ZZ
2LTF3W		467.40	1.80	0.14	503.20	-0.77	-0.05	ZZ
3FL7KE		460.80	-4.80	-0.38	493.40	-10.57	-0.75	ZZ
3Q3YQF		467.12	1.52	0.12	513.52	9.55	0.68	ZZ
3UKC9H		462.48	-3.12	-0.24	499.82	-4.15	-0.30	ZZ
3WUZ44		466.40	0.80	0.06	509.00	5.03	0.36	ZZ
47B7HQ		456.20	-9.40	-0.73	515.40	11.43	0.81	ZZ
69EMR7		474.80	9.20	0.72	513.60	9.63	0.69	ZZ
6ZL92U		473.40	7.80	0.61	503.60	-0.37	-0.03	ZZ
736KPB		451.40	-14.20	-1.11	489.40	-14.57	-1.04	ZZ
7KNGUX		445.60	-20.00	-1.56	484.80	-19.17	-1.37	ZZ
7NNRPX		459.60	-6.00	-0.47	496.80	-7.17	-0.51	ZZ
88E8TE		459.80	-5.80	-0.45	485.20	-18.77	-1.34	ZZ
8G6NNB		463.02	-2.58	-0.20	501.44	-2.53	-0.18	ZZ
9E8U4B	X	123.73	-341.87	-26.71	119.48	-384.49	-27.40	ZZ
B4ZV7L		463.00	-2.60	-0.20	507.34	3.37	0.24	ZZ
BG8QRJ	*	497.80	32.20	2.52	514.60	10.63	0.76	ZZ
BH39UK		480.64	15.04	1.18	499.16	-4.81	-0.34	ZZ
BJBK G2		479.04	13.44	1.05	523.96	19.99	1.42	ZZ
CBFV9Q		483.60	18.00	1.41	516.40	12.43	0.89	ZZ
CHWBYF		472.60	7.00	0.55	509.80	5.83	0.42	ZZ
CPXKHZ		458.34	-7.26	-0.57	496.34	-7.63	-0.54	ZZ
DDY474		475.00	9.40	0.73	520.00	16.03	1.14	ZZ
DK2HLD		454.00	-11.60	-0.91	488.40	-15.57	-1.11	ZZ
DPVF8B		473.80	8.20	0.64	514.00	10.03	0.72	ZZ
DTF2C4		455.76	-9.84	-0.77	504.59	0.62	0.04	ZZ
E3VH94		454.36	-11.24	-0.88	496.08	-7.89	-0.56	ZZ
E6Z6QE		473.80	8.20	0.64	506.40	2.43	0.17	ZZ
EP99NJ	*	496.70	31.10	2.43	539.32	35.35	2.52	ZZ
EYCJRF		476.00	10.40	0.81	512.60	8.63	0.62	ZZ
FVTQJ7		466.22	0.62	0.05	501.12	-2.85	-0.20	ZZ
G79RKX		477.56	11.96	0.93	516.74	12.77	0.91	ZZ
JGJ88B		467.00	1.40	0.11	518.60	14.63	1.04	ZZ
K22V4T		450.66	-14.94	-1.17	479.80	-24.17	-1.72	ZZ
K2JQMF		469.00	3.40	0.27	505.60	1.63	0.12	ZZ
K88EFZ		455.58	-10.02	-0.78	497.56	-6.41	-0.46	ZZ
KB8PCZ		457.60	-8.00	-0.63	512.80	8.83	0.63	ZZ
KLQZYK		451.20	-14.40	-1.13	493.00	-10.97	-0.78	ZZ
LCZYRA		482.24	16.64	1.30	512.32	8.35	0.60	ZZ
LTNBBG		453.54	-12.06	-0.94	508.26	4.29	0.31	ZZ
MH384G		449.60	-16.00	-1.25	486.40	-17.57	-1.25	ZZ
MT3WM4		477.80	12.20	0.95	500.40	-3.57	-0.25	ZZ
NTVAHV		440.40	-25.20	-1.97	472.00	-31.97	-2.28	ZZ
NUBJHM		444.40	-21.20	-1.66	475.40	-28.57	-2.04	ZZ
NZEDQX		464.42	-1.18	-0.09	491.44	-12.53	-0.89	ZZ
PCLHFP		465.20	-0.40	-0.03	500.40	-3.57	-0.25	ZZ
PNZVBY	X	465.60	0.00	0.00	461.80	-42.17	-3.01	ZZ
PPVDDZ		444.02	-21.58	-1.69	478.62	-25.35	-1.81	ZZ
PTF2FL		471.60	6.00	0.47	527.80	23.83	1.70	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 121  
Microhardness - Knoop Hardness Number (500 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
PVH4YV		450.20	-15.40	-1.20	498.60	-5.37	-0.38	ZZ
Q47LNN	X	420.12	-45.48	-3.55	500.00	-3.97	-0.28	ZZ
Q6Z6RB		490.60	25.00	1.95	534.60	30.63	2.18	ZZ
R3VUHT		458.20	-7.40	-0.58	502.40	-1.57	-0.11	ZZ
RMD74N		466.00	0.40	0.03	488.00	-15.97	-1.14	ZZ
RNVWD9		465.20	-0.40	-0.03	523.60	19.63	1.40	ZZ
T6YQK9		469.60	4.00	0.31	511.20	7.23	0.52	ZZ
U3K2FM		467.62	2.02	0.16	526.38	22.41	1.60	ZZ
U76XZ7		462.20	-3.40	-0.27	508.00	4.03	0.29	ZZ
UTJENP		444.60	-21.00	-1.64	490.60	-13.37	-0.95	ZZ
V7JKCT		453.40	-12.20	-0.95	487.60	-16.37	-1.17	ZZ
V9PXZM		463.40	-2.20	-0.17	506.40	2.43	0.17	ZZ
WE67MW		480.20	14.60	1.14	493.20	-10.77	-0.77	ZZ
WUNL4N		457.80	-7.80	-0.61	503.80	-0.17	-0.01	ZZ
WYJDCK		463.40	-2.20	-0.17	507.40	3.43	0.24	ZZ
WZP48T	*	476.80	11.20	0.88	486.80	-17.17	-1.22	ZZ
X2YC2Y		463.00	-2.60	-0.20	501.00	-2.97	-0.21	ZZ
XJZEFH		470.58	4.98	0.39	513.56	9.59	0.68	ZZ
Y7QY4Y		460.00	-5.60	-0.44	495.00	-8.97	-0.64	ZZ
YBFFJH		484.20	18.60	1.45	531.60	27.63	1.97	ZZ
YCDMY4		456.40	-9.20	-0.72	491.80	-12.17	-0.87	ZZ
ZD9LMF		482.00	16.40	1.28	517.60	13.63	0.97	ZZ
ZP33CG		460.00	-5.60	-0.44	498.80	-5.17	-0.37	ZZ
ZPXLH		460.74	-4.86	-0.38	508.74	4.77	0.34	ZZ

Summary Statistics

	Sample S33		Sample S34	
Grand Means	465.60	HK 500 gf	503.97	HK 500 gf
Std Dev Btwn Labs	12.80	HK 500 gf	14.03	HK 500 gf

Samples S33 , S34 : Steel

Statistics based on 70 of 73 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 121  
Microhardness - Knoop Hardness Number (500 gf)  
ASTM E384

**Comments on assigned Data Flags for Analysis #121**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
9E8U4B	X	Data for both samples are low.
PNZVBY	X	Data for sample S34 are low.
Q47LNN	X	Data for sample S33 are low.

Cycle 113  
1st Q, 2016

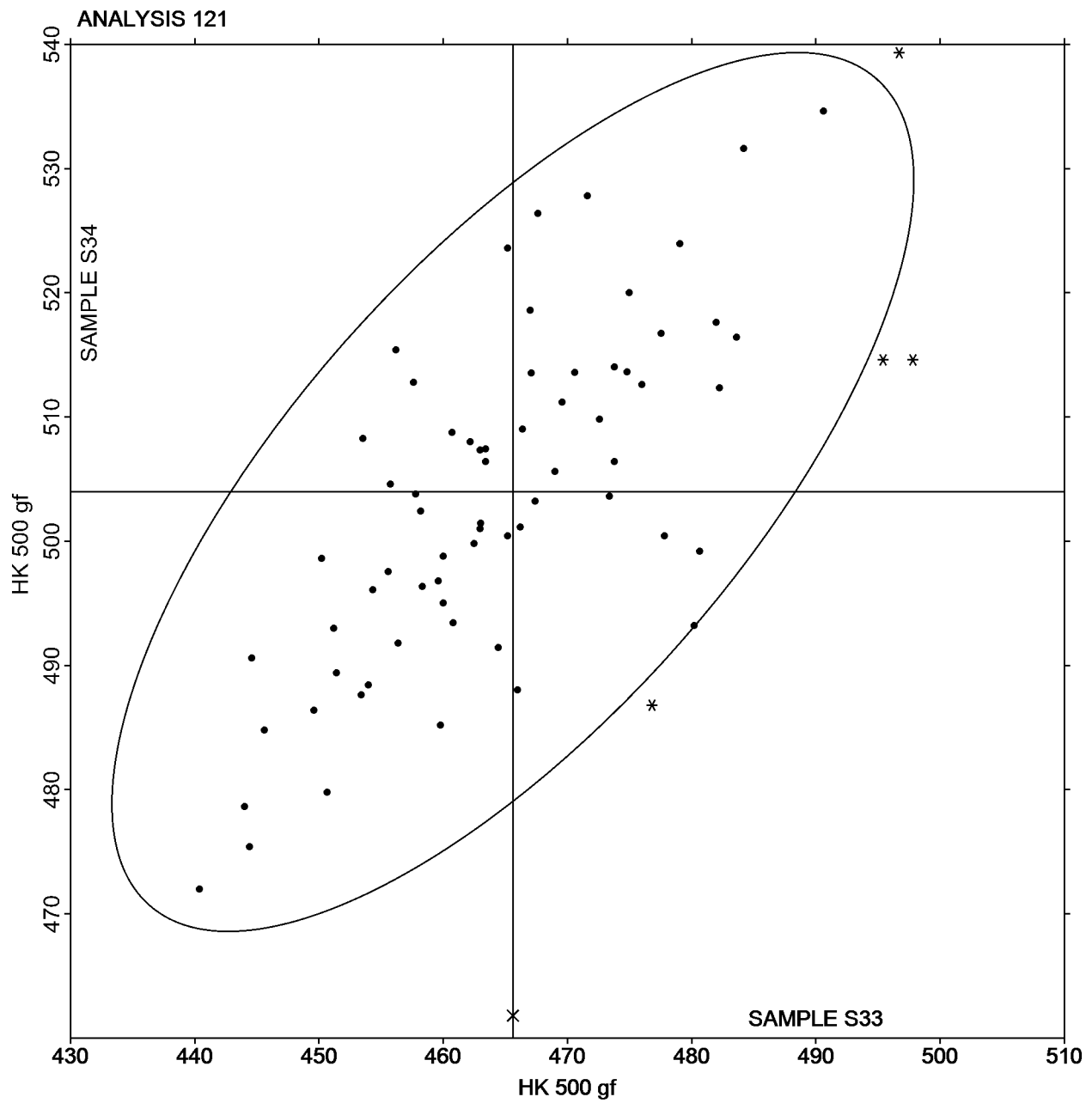
### Interlaboratory Testing Program for Metals

### Analysis 121

Microhardness - Knoop Hardness Number (500 gf)  
ASTM E384

SAMPLE S33  
465.60 HK 500 gf

SAMPLE S34  
503.97 HK 500 gf





Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 122  
Microhardness - Knoop Hardness Number (200 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26AG8J		485.80	12.18	0.85	531.00	15.62	0.94	ZZ
2LTF3W		477.40	3.78	0.26	521.80	6.42	0.39	ZZ
3FL7KE		462.20	-11.42	-0.80	510.20	-5.18	-0.31	ZZ
3UKC9H		449.98	-23.64	-1.65	504.66	-10.72	-0.64	ZZ
69EMR7		485.60	11.98	0.84	524.40	9.02	0.54	ZZ
736KPB		469.40	-4.22	-0.29	511.00	-4.38	-0.26	ZZ
7KNGUX		484.60	10.98	0.77	514.00	-1.38	-0.08	ZZ
88E8TE		466.00	-7.62	-0.53	509.60	-5.78	-0.35	ZZ
8G6NNB		470.74	-2.88	-0.20	510.56	-4.82	-0.29	ZZ
B4ZV7L		479.00	5.38	0.37	517.14	1.76	0.11	ZZ
BG8QRJ		501.80	28.18	1.96	533.40	18.02	1.08	ZZ
BH39UK	*	485.36	11.74	0.82	500.40	-14.98	-0.90	ZZ
BJBKG2		486.24	12.62	0.88	526.04	10.66	0.64	ZZ
CBFV9Q		492.20	18.58	1.30	535.60	20.22	1.21	ZZ
CHWBYF		482.40	8.78	0.61	507.40	-7.98	-0.48	ZZ
DK2HLD		456.20	-17.42	-1.21	510.00	-5.38	-0.32	ZZ
DTF2C4		459.47	-14.15	-0.99	504.44	-10.94	-0.66	ZZ
EP99NJ	*	505.84	32.22	2.25	568.02	52.64	3.16	ZZ
EYCJRF		474.40	0.78	0.05	507.60	-7.78	-0.47	ZZ
FVTQJ7		473.00	-0.62	-0.04	509.18	-6.20	-0.37	ZZ
G79RKX		473.98	0.36	0.03	521.46	6.08	0.36	ZZ
JGJ88B		486.60	12.98	0.90	534.80	19.42	1.17	ZZ
K22V4T		457.76	-15.86	-1.11	479.58	-35.80	-2.15	ZZ
K2JQMF		468.00	-5.62	-0.39	518.80	3.42	0.21	ZZ
K88EFZ		461.16	-12.46	-0.87	500.70	-14.68	-0.88	ZZ
KB8PCZ		463.40	-10.22	-0.71	511.20	-4.18	-0.25	ZZ
LCZYRA		495.46	21.84	1.52	516.38	1.00	0.06	ZZ
LTNBBG		477.18	3.56	0.25	520.96	5.58	0.33	ZZ
MH384G		478.80	5.18	0.36	518.80	3.42	0.21	ZZ
NTVAHV		463.00	-10.62	-0.74	493.20	-22.18	-1.33	ZZ
NUBJHM		439.40	-34.22	-2.39	482.00	-33.38	-2.01	ZZ
PNZVBY	X	466.80	-6.82	-0.48	461.20	-54.18	-3.25	ZZ
PTF2FL		492.60	18.98	1.32	544.40	29.02	1.74	ZZ
PVH4YV		459.60	-14.02	-0.98	507.60	-7.78	-0.47	ZZ
Q6Z6RB		482.20	8.58	0.60	515.40	0.02	0.00	ZZ
RMD74N		463.40	-10.22	-0.71	486.20	-29.18	-1.75	ZZ
RNVWD9		471.80	-1.82	-0.13	522.60	7.22	0.43	ZZ
U76XZ7		473.60	-0.02	0.00	522.40	7.02	0.42	ZZ
UTJENP		457.00	-16.62	-1.16	503.80	-11.58	-0.70	ZZ
V7JKCT		485.00	11.38	0.79	541.20	25.82	1.55	ZZ
V9PXZM		491.60	17.98	1.25	548.60	33.22	2.00	ZZ
WE67MW		482.00	8.38	0.58	514.00	-1.38	-0.08	ZZ
WUNL4N		458.20	-15.42	-1.08	494.60	-20.78	-1.25	ZZ
WYJDCK		476.80	3.18	0.22	514.60	-0.78	-0.05	ZZ
X2YC2Y		475.00	1.38	0.10	516.80	1.42	0.08	ZZ
Y7QY4Y		479.40	5.78	0.40	532.20	16.82	1.01	ZZ
YCDMY4		451.20	-22.42	-1.56	499.40	-15.98	-0.96	ZZ
ZD9LMF		481.20	7.58	0.53	522.80	7.42	0.45	ZZ
ZP33CG		466.20	-7.42	-0.52	503.20	-12.18	-0.73	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 122  
Microhardness - Knoop Hardness Number (200 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
ZPXLEH		448.26	-25.36	-1.77	509.74	-5.64	-0.34	ZZ

Summary Statistics				
	Sample S33		Sample S34	
Grand Means	473.62	HK 200 gf	515.38	HK 200 gf
Std Dev Btwn Labs	14.34	HK 200 gf	16.65	HK 200 gf

Samples S33 , S34 : Steel

Statistics based on 49 of 50 reporting participants

**Comments on assigned Data Flags for Analysis #122**

WebCode   Flag   Analyst Comment

PNZVBY   X   Data for sample S34 are low.

Cycle 113  
1st Q, 2016

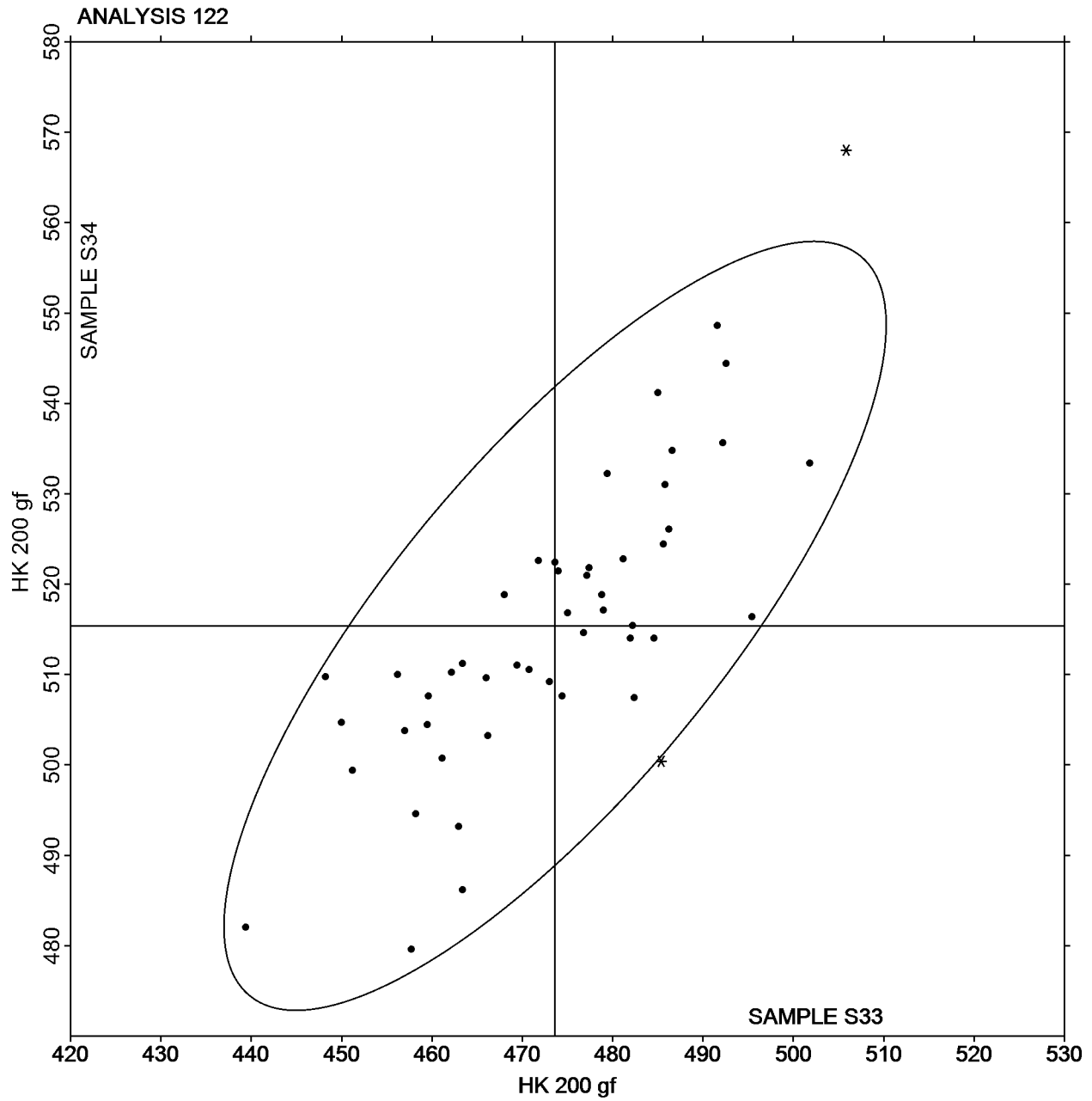
### Interlaboratory Testing Program for Metals

### Analysis 122

Microhardness - Knoop Hardness Number (200 gf)  
ASTM E384

SAMPLE S33  
473.62 HK 200 gf

SAMPLE S34  
515.38 HK 200 gf



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 123  
Microhardness - Vickers Hardness Number (500 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		445.20	-0.07	-0.01	483.40	-4.30	-0.40	ZZ
26AG8J		442.80	-2.47	-0.30	485.60	-2.10	-0.20	ZZ
2LTF3W		448.20	2.93	0.35	487.80	0.10	0.01	ZZ
3CZJGL		463.88	18.61	2.23	497.54	9.84	0.92	ZZ
3FL7KE		440.20	-5.07	-0.61	478.40	-9.30	-0.87	ZZ
3UKC9H		431.76	-13.51	-1.62	464.12	-23.58	-2.21	ZZ
47B7HQ		436.80	-8.47	-1.02	475.60	-12.10	-1.13	ZZ
4YTYJY		439.00	-6.27	-0.75	483.40	-4.30	-0.40	ZZ
69EMR7		444.80	-0.47	-0.06	487.00	-0.70	-0.07	ZZ
6GVUYB		427.68	-17.59	-2.11	475.42	-12.28	-1.15	ZZ
6MCC9D		429.00	-16.27	-1.95	466.40	-21.30	-2.00	ZZ
6ZL92U		449.20	3.93	0.47	479.20	-8.50	-0.80	ZZ
736KPB		430.00	-15.27	-1.83	478.20	-9.50	-0.89	ZZ
7FN9EF		450.20	4.93	0.59	503.40	15.70	1.47	ZZ
7KNGUX		436.20	-9.07	-1.09	481.40	-6.30	-0.59	ZZ
88E8TE		440.20	-5.07	-0.61	483.40	-4.30	-0.40	ZZ
8G6NNB		436.58	-8.69	-1.04	484.78	-2.92	-0.27	ZZ
93ECJQ		440.40	-4.87	-0.59	478.80	-8.90	-0.83	ZZ
9C4UA7		455.60	10.33	1.24	505.20	17.50	1.64	ZZ
9QNHAA	X	504.84	59.57	7.15	466.48	-21.22	-1.99	ZZ
AJH6UK		443.06	-2.21	-0.27	484.50	-3.20	-0.30	ZZ
ARC949		447.60	2.33	0.28	497.20	9.50	0.89	ZZ
AUHV8R	X	472.46	27.19	3.26	505.00	17.30	1.62	ZZ
AYA3VF		436.46	-8.81	-1.06	480.22	-7.48	-0.70	ZZ
B4ZV7L	X	459.06	13.79	1.66	531.16	43.46	4.07	ZZ
BG8QRJ		456.20	10.93	1.31	491.00	3.30	0.31	ZZ
BH39UK	*	446.34	1.07	0.13	468.92	-18.78	-1.76	ZZ
BJQWUR		445.28	0.01	0.00	483.76	-3.94	-0.37	ZZ
BQELJG		450.40	5.13	0.62	499.20	11.50	1.08	ZZ
BXWWTB		449.60	4.33	0.52	504.20	16.50	1.55	ZZ
CBFV9Q	*	466.40	21.13	2.54	515.40	27.70	2.60	ZZ
CHWBYF		453.80	8.53	1.02	496.80	9.10	0.85	ZZ
CPXKHZ		426.24	-19.03	-2.29	471.14	-16.56	-1.55	ZZ
DDY474		447.40	2.13	0.26	490.60	2.90	0.27	ZZ
DGLN3M		456.76	11.49	1.38	494.86	7.16	0.67	ZZ
DK2HLD		436.80	-8.47	-1.02	480.40	-7.30	-0.68	ZZ
DPVF8B	X	473.40	28.13	3.38	493.80	6.10	0.57	ZZ
DRKJA3		435.20	-10.07	-1.21	488.80	1.10	0.10	ZZ
DTF2C4		435.47	-9.80	-1.18	481.27	-6.44	-0.60	ZZ
DXL6Q6		451.60	6.33	0.76	491.00	3.30	0.31	ZZ
E3VH94		435.20	-10.07	-1.21	473.80	-13.90	-1.30	ZZ
E6Z6QE		447.60	2.33	0.28	480.80	-6.90	-0.65	ZZ
EDFP3D		455.80	10.53	1.26	495.00	7.30	0.68	ZZ
EP99NJ		441.24	-4.03	-0.48	492.36	4.66	0.44	ZZ
EYBPX2		445.16	-0.11	-0.01	497.08	9.38	0.88	ZZ
F2YK9M		455.60	10.33	1.24	498.60	10.90	1.02	ZZ
FFEJH3		450.56	5.29	0.63	494.82	7.12	0.67	ZZ
FL7P2B		448.20	2.93	0.35	486.38	-1.32	-0.12	ZZ
FQZNCZ		454.20	8.93	1.07	489.80	2.10	0.20	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 123  
Microhardness - Vickers Hardness Number (500 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
FVTQJ7		447.16	1.89	0.23	481.82	-5.88	-0.55	ZZ
FW4PEF		447.80	2.53	0.30	492.40	4.70	0.44	ZZ
G79RKX		443.94	-1.33	-0.16	485.44	-2.26	-0.21	ZZ
JDKVBB		456.54	11.27	1.35	503.40	15.70	1.47	ZZ
JNZPRH		448.96	3.69	0.44	494.80	7.10	0.67	ZZ
K22V4T		436.52	-8.75	-1.05	475.40	-12.30	-1.15	ZZ
K2JQMF		432.60	-12.67	-1.52	482.00	-5.70	-0.53	ZZ
KB8PCZ		450.60	5.33	0.64	497.60	9.90	0.93	ZZ
KLQZYK		443.00	-2.27	-0.27	491.40	3.70	0.35	ZZ
KM7DDU	X	402.40	-42.87	-5.15	441.40	-46.30	-4.34	ZZ
LCZYRA		456.20	10.93	1.31	484.80	-2.90	-0.27	ZZ
M2VAHW		452.40	7.13	0.86	482.20	-5.50	-0.52	ZZ
MH384G		448.20	2.93	0.35	480.00	-7.70	-0.72	ZZ
MT3WM4		447.40	2.13	0.26	489.20	1.50	0.14	ZZ
N4FERF	X	44.62	-400.65	-48.11	47.84	-439.86	-41.24	ZZ
NTVAHV		433.60	-11.67	-1.40	474.60	-13.10	-1.23	ZZ
NUBJHM	X	416.40	-28.87	-3.47	456.40	-31.30	-2.93	ZZ
NVNX6W		445.60	0.33	0.04	488.40	0.70	0.07	ZZ
NXRUPZ		446.80	1.53	0.18	489.00	1.30	0.12	ZZ
P4CAP4		449.60	4.33	0.52	495.60	7.90	0.74	ZZ
PCLHFP		447.00	1.73	0.21	486.00	-1.70	-0.16	ZZ
PNZVBY	X	435.60	-9.67	-1.16	430.00	-57.70	-5.41	ZZ
PTF2FL		442.20	-3.07	-0.37	492.20	4.50	0.42	ZZ
PVH4YV		440.40	-4.87	-0.59	483.60	-4.10	-0.38	ZZ
Q6Z6RB	*	445.20	-0.07	-0.01	510.00	22.30	2.09	ZZ
QPCV3E		449.80	4.53	0.54	490.40	2.70	0.25	ZZ
R3VUHT		434.40	-10.87	-1.31	473.80	-13.90	-1.30	ZZ
R86WKN		441.40	-3.87	-0.47	488.60	0.90	0.08	ZZ
RMD74N		449.40	4.13	0.50	491.60	3.90	0.37	ZZ
RNVWD9		443.20	-2.07	-0.25	471.20	-16.50	-1.55	ZZ
RZLM8Z	X	476.34	31.07	3.73	495.48	7.78	0.73	ZZ
TQWL3A	*	466.80	21.53	2.58	510.20	22.50	2.11	ZZ
TUUZPY		453.80	8.53	1.02	505.60	17.90	1.68	ZZ
U3K2FM		449.60	4.33	0.52	498.80	11.10	1.04	ZZ
U69FY6		461.40	16.13	1.94	506.60	18.90	1.77	ZZ
U76XZ7		445.60	0.33	0.04	490.00	2.30	0.22	ZZ
UTJENP		427.60	-17.67	-2.12	465.40	-22.30	-2.09	ZZ
V7JKCT	X	398.40	-46.87	-5.63	408.60	-79.10	-7.42	ZZ
VYXN7J		447.20	1.93	0.23	500.20	12.50	1.17	ZZ
WE67MW		451.20	5.93	0.71	489.80	2.10	0.20	ZZ
WRH6P6		448.40	3.13	0.38	493.00	5.30	0.50	ZZ
WUNL4N		437.20	-8.07	-0.97	488.00	0.30	0.03	ZZ
WYJDCK		449.60	4.33	0.52	496.20	8.50	0.80	ZZ
WYVGGW		444.80	-0.47	-0.06	500.80	13.10	1.23	ZZ
WZP48T		445.40	0.13	0.02	478.40	-9.30	-0.87	ZZ
X2YC2Y		435.40	-9.87	-1.19	483.80	-3.90	-0.37	ZZ
X79QBX	X	474.54	29.27	3.51	548.40	60.70	5.69	ZZ
XKCVVG		455.80	10.53	1.26	489.60	1.90	0.18	ZZ
XPKEVV		437.04	-8.23	-0.99	463.62	-24.08	-2.26	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 123

Microhardness - Vickers Hardness Number (500 gf)  
ASTM E384

WebCode	Data Flag	Sample S33			Sample S34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XRE2LT		442.20	-3.07	-0.37	481.00	-6.70	-0.63	ZZ
Y7P7AK		446.20	0.93	0.11	496.20	8.50	0.80	ZZ
Y7QY4Y		449.40	4.13	0.50	481.40	-6.30	-0.59	ZZ
YCDMY4		453.40	8.13	0.98	497.20	9.50	0.89	ZZ
YG8JNV		441.80	-3.47	-0.42	492.20	4.50	0.42	ZZ
ZA379W		439.60	-5.67	-0.68	466.80	-20.90	-1.96	ZZ
ZD9LMF		453.44	8.17	0.98	492.72	5.02	0.47	ZZ
ZP33CG		442.40	-2.87	-0.35	490.60	2.90	0.27	ZZ
ZPXLEH		441.80	-3.47	-0.42	484.20	-3.50	-0.33	ZZ
ZTV68V		438.80	-6.47	-0.78	482.60	-5.10	-0.48	ZZ

Summary Statistics

	Sample S33		Sample S34	
Grand Means	445.27	HV 500 gf	487.70	HV 500 gf
Std Dev Btwn Labs	8.33	HV 500 gf	10.67	HV 500 gf

Samples S33 , S34 : Steel

Statistics based on 97 of 108 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 123  
Microhardness - Vickers Hardness Number (500 gf)  
ASTM E384

**Comments on assigned Data Flags for Analysis #123**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
9QNHAH	X	Data for sample S33 are high.
AUHV8R	X	Data for sample S33 are high.
B4ZV7L	X	Data for sample S34 are high.
DPVF8B	X	Data for sample S33 are high.
KM7DDU	X	Data for both samples are low. Inconsistent within the determinations of both samples.
N4FERF	X	Data for both samples are low.
NUBJHM	X	Data for both samples are low.
PNZVBY	X	Data for sample S34 are low.
RZLM8Z	X	Data for sample S33 are high.
V7JKCT	X	Data for both samples are low.
X79QBX	X	Data for both samples are high. Inconsistent within the determinations of sample S33.

Cycle 113  
1st Q, 2016

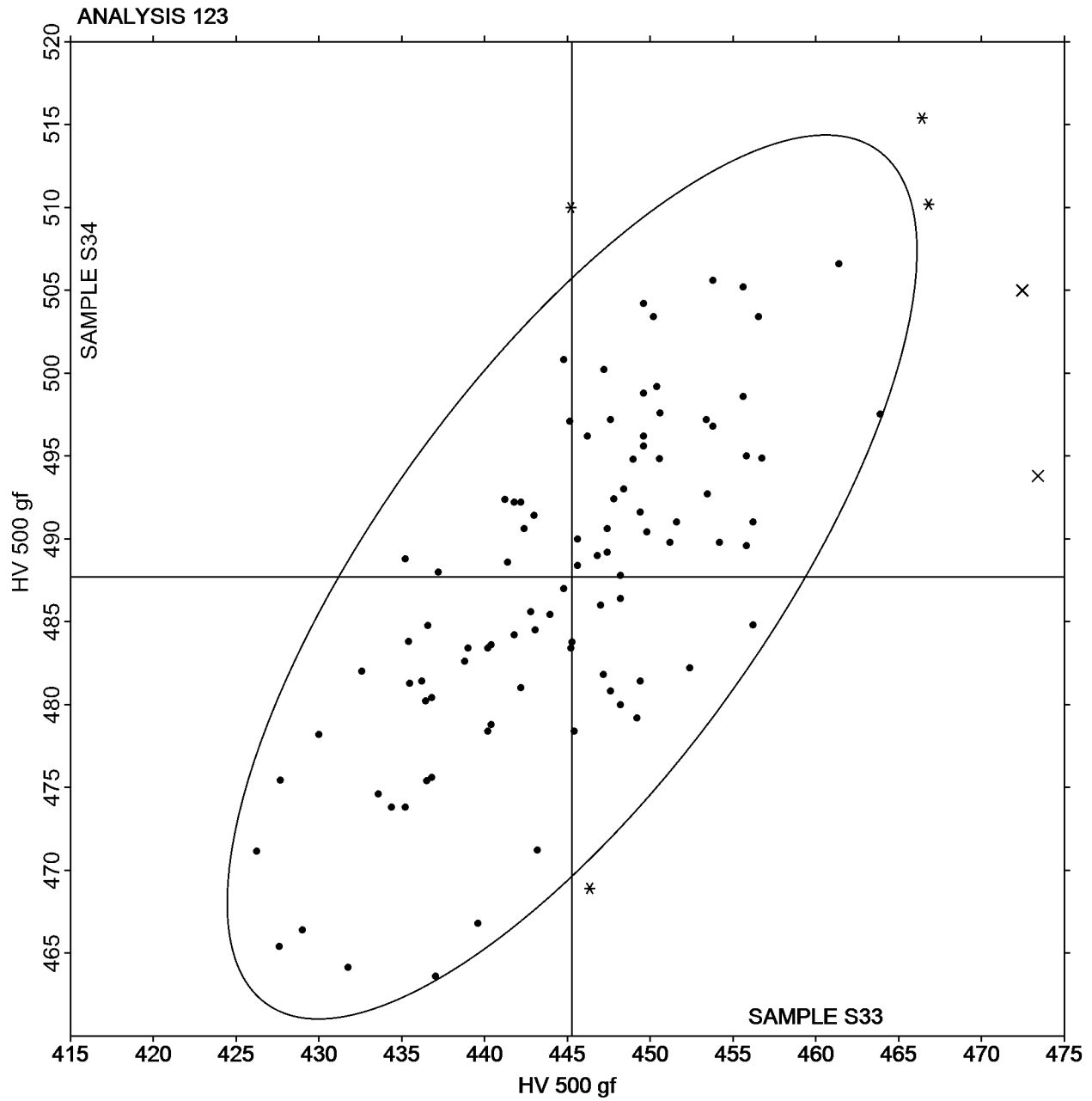
### Interlaboratory Testing Program for Metals

### Analysis 123

Microhardness - Vickers Hardness Number (500 gf)  
ASTM E384

SAMPLE S33  
445.27 HV 500 gf

SAMPLE S34  
487.70 HV 500 gf





Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 135  
Brinell Hardness - HBW  
ASTM E10

WebCode	Data Flag	Sample D33			Sample D34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
38PFVX		357.80	-0.35	-0.05	399.60	0.13	0.02	ZZ
3FL7KE		340.40	-17.75	-2.30	381.20	-18.27	-2.24	ZZ
3HAMUM		352.00	-6.15	-0.80	401.00	1.53	0.19	ZZ
3X66GR		356.40	-1.75	-0.23	396.40	-3.07	-0.38	ZZ
4VW7UB	X	259.00	-99.15	-12.87	388.00	-11.47	-1.41	ZZ
69CU8R		359.60	1.45	0.19	398.80	-0.67	-0.08	ZZ
69EMR7	X	3.320	-354.83	-46.06	3.120	-396.35	-48.57	ZZ
6GRCUL		367.00	8.85	1.15	414.40	14.93	1.83	ZZ
7KNGUX		365.60	7.45	0.97	414.60	15.13	1.85	ZZ
88E8TE		351.00	-7.15	-0.93	397.40	-2.07	-0.25	ZZ
89QYMG		360.20	2.05	0.27	399.20	-0.27	-0.03	ZZ
993XHQ		354.80	-3.35	-0.44	396.60	-2.87	-0.35	ZZ
9C4UA7		348.60	-9.55	-1.24	395.80	-3.67	-0.45	ZZ
9CZC6F		355.60	-2.55	-0.33	400.60	1.13	0.14	ZZ
AJH6UK		361.80	3.65	0.47	403.00	3.53	0.43	ZZ
BG8QRJ		360.40	2.25	0.29	398.40	-1.07	-0.13	ZZ
CPXKHZ		357.80	-0.35	-0.05	397.00	-2.47	-0.30	ZZ
CQT4K2		368.20	10.05	1.30	406.40	6.93	0.85	ZZ
DA2VMG	X	3.200	-354.95	-46.07	3.000	-396.47	-48.59	ZZ
DK2HLD		354.00	-4.15	-0.54	398.00	-1.47	-0.18	ZZ
DPVF8B		359.60	1.45	0.19	397.00	-2.47	-0.30	ZZ
E6Z6QE	X	376.60	18.45	2.39	398.60	-0.87	-0.11	ZZ
EC2GLB		361.00	2.85	0.37	403.40	3.93	0.48	ZZ
EFYZVC		363.00	4.85	0.63	398.00	-1.47	-0.18	ZZ
EVBGTQ		360.80	2.65	0.34	401.00	1.53	0.19	ZZ
FAP6GE		352.00	-6.15	-0.80	385.80	-13.67	-1.68	ZZ
FAULFD		350.00	-8.15	-1.06	390.60	-8.87	-1.09	ZZ
FGQC6U	X	331.00	-27.15	-3.52	375.00	-24.47	-3.00	ZZ
FPPNE7		354.80	-3.35	-0.44	398.00	-1.47	-0.18	ZZ
FUY2W6		341.00	-17.15	-2.23	388.00	-11.47	-1.41	ZZ
FVTQJ7		363.00	4.85	0.63	401.00	1.53	0.19	ZZ
G8KWQA		360.00	1.85	0.24	388.00	-11.47	-1.41	ZZ
GQF4FF		364.80	6.65	0.86	409.60	10.13	1.24	ZZ
JLCBV9		363.00	4.85	0.63	401.00	1.53	0.19	ZZ
KKVHXJ		363.80	5.65	0.73	405.80	6.33	0.78	ZZ
KLQZYK		362.80	4.65	0.60	404.40	4.93	0.60	ZZ
LWLRPV		363.00	4.85	0.63	415.00	15.53	1.90	ZZ
LZK3LV		363.00	4.85	0.63	401.00	1.53	0.19	ZZ
MDBZK9		361.80	3.65	0.47	391.20	-8.27	-1.01	ZZ
MH384G		352.00	-6.15	-0.80	401.00	1.53	0.19	ZZ
MKN73X		344.00	-14.15	-1.84	389.20	-10.27	-1.26	ZZ
MT3WM4		354.60	-3.55	-0.46	403.40	3.93	0.48	ZZ
MXAMPA		360.80	2.65	0.34	409.40	9.93	1.22	ZZ
NDMCB4		357.20	-0.95	-0.12	391.80	-7.67	-0.94	ZZ
NTVAHV		351.00	-7.15	-0.93	397.40	-2.07	-0.25	ZZ
PHWPT3		373.60	15.45	2.00	415.00	15.53	1.90	ZZ
PTF2FL		357.60	-0.55	-0.07	397.80	-1.67	-0.20	ZZ
PVH4YV		360.88	2.73	0.35	399.48	0.01	0.00	ZZ
Q4QWY6		364.80	6.65	0.86	412.40	12.93	1.58	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 135

Brinell Hardness - HBW  
ASTM E10

WebCode	Data Flag	Sample D33			Sample D34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QPCV3E		363.20	5.05	0.65	392.00	-7.47	-0.92	ZZ
RUHNT4		374.20	16.05	2.08	412.20	12.73	1.56	ZZ
TA98UW		363.00	4.85	0.63	403.80	4.33	0.53	ZZ
UA3DK3		366.00	7.85	1.02	404.20	4.73	0.58	ZZ
UEUJ76		350.80	-7.35	-0.95	395.80	-3.67	-0.45	ZZ
V8UEXL		343.00	-15.15	-1.97	388.00	-11.47	-1.41	ZZ
VG6NJT		359.40	1.25	0.16	404.40	4.93	0.60	ZZ
VLBELY		363.00	4.85	0.63	415.00	15.53	1.90	ZZ
WLA3B3		360.80	2.65	0.34	399.70	0.23	0.03	ZZ
WRH6P6		356.40	-1.75	-0.23	385.60	-13.87	-1.70	ZZ
WUNL4N		346.30	-11.85	-1.54	393.54	-5.93	-0.73	ZZ
WZP48T		362.60	4.45	0.58	391.80	-7.67	-0.94	ZZ
X2YC2Y		358.00	-0.15	-0.02	398.20	-1.27	-0.16	ZZ
XDP79L		352.00	-6.15	-0.80	401.00	1.53	0.19	ZZ
XELFFX		360.00	1.85	0.24	396.80	-2.67	-0.33	ZZ
XF3TTL	X	341.00	-17.15	-2.23	401.00	1.53	0.19	ZZ
Y7QY4Y		375.00	16.85	2.19	409.80	10.33	1.27	ZZ
Y8HUWL		362.20	4.05	0.53	402.20	2.73	0.33	ZZ
YANKRV		370.00	11.85	1.54	415.00	15.53	1.90	ZZ
YQYZ6W	X	415.80	57.65	7.48	418.20	18.73	2.30	ZZ
YT3VPZ		357.20	-0.95	-0.12	392.80	-6.67	-0.82	ZZ
ZD9LMF		341.00	-17.15	-2.23	388.00	-11.47	-1.41	ZZ
ZP33CG		352.00	-6.15	-0.80	388.00	-11.47	-1.41	ZZ
ZPXLH		344.20	-13.95	-1.81	388.80	-10.67	-1.31	ZZ
ZVM6AK		361.00	2.85	0.37	403.80	4.33	0.53	ZZ

Summary Statistics

	Sample D33		Sample D34	
Grand Means	358.15	HBW	399.47	HBW
Std Dev Btwn Labs	7.70	HBW	8.16	HBW

Samples D33 , D34 : Steel

Statistics based on 67 of 74 reporting participants

Samples D33 , D34 are hardness test blocks made from steel. The blocks are heat treated to hardness levels specified by CTS.

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 135  
Brinell Hardness - HBW  
ASTM E10

**Comments on assigned Data Flags for Analysis #135**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>4VW7UB</b>	X	Data for sample D33 are low. Inconsistent in testing between samples.
<b>69EMR7</b>	X	Data for both samples are low. Possible Systematic error.
<b>DA2VMG</b>	X	Data for both samples are low. Possible Systematic error.
<b>E6Z6QE</b>	X	Inconsistent in testing between samples.
<b>FGQC6U</b>	X	Data for both samples are low. Possible Systematic error.
<b>XF3TTL</b>	X	Inconsistent in testing between samples.
<b>YQYZ6W</b>	X	Data for sample D33 are high. Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

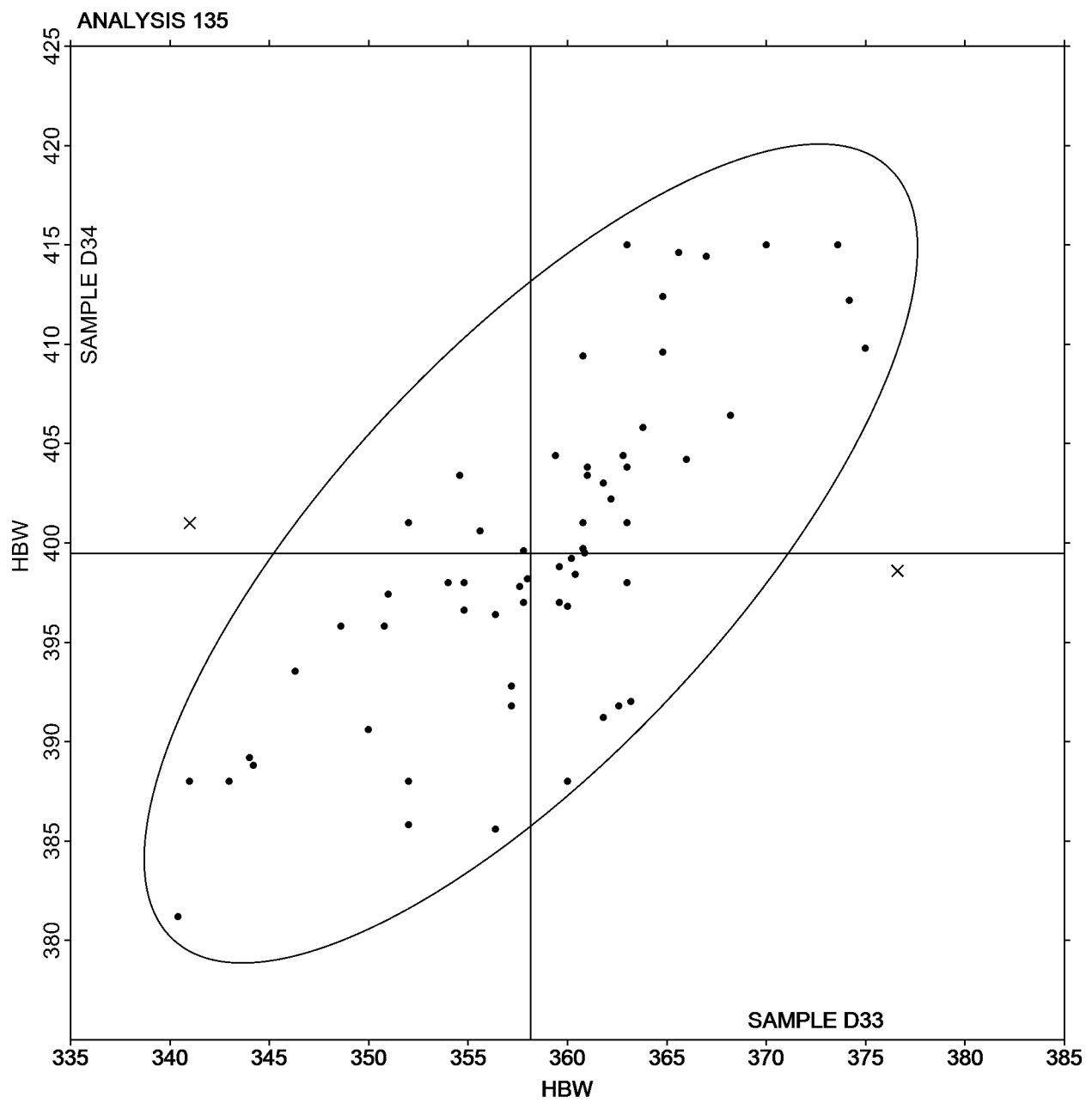
# Interlaboratory Testing Program for Metals

## Analysis 135

Brinell Hardness - HBW  
ASTM E10

SAMPLE D33  
358.15 HBW

SAMPLE D34  
399.47 HBW



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 140  
Tensile Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24D8UT		72.10	-0.11	-0.12	72.30	-0.38	-0.48	ZZ
26AG8J		72.70	0.49	0.57	72.90	0.22	0.28	ZZ
27F6B3		71.43	-0.78	-0.90	72.07	-0.61	-0.77	ZZ
2LTF3W	X	72.70	0.49	0.57	71.60	-1.08	-1.37	ZZ
33WB3U		72.20	-0.01	-0.01	73.00	0.32	0.40	ZZ
38PFVX		71.65	-0.56	-0.65	72.08	-0.60	-0.76	ZZ
3FL7KE		72.50	0.29	0.34	72.50	-0.18	-0.23	ZZ
3HAMUM		70.80	-1.41	-1.63	71.30	-1.38	-1.75	ZZ
63N8CM		70.34	-1.86	-2.16	71.21	-1.47	-1.86	ZZ
69CU8R		71.36	-0.85	-0.98	71.89	-0.79	-1.00	ZZ
69EMR7		71.40	-0.81	-0.94	72.40	-0.28	-0.36	ZZ
6GRCUL		74.17	1.97	2.28	73.90	1.22	1.54	ZZ
73MDH9		72.50	0.29	0.34	73.00	0.32	0.40	ZZ
7KNGUX		72.32	0.11	0.13	72.81	0.13	0.16	ZZ
7Q9G8P		72.20	-0.01	-0.01	72.90	0.22	0.28	ZZ
87L8PP	*	73.76	1.56	1.80	74.69	2.01	2.53	ZZ
88E8TE		71.80	-0.41	-0.47	72.10	-0.58	-0.74	ZZ
89QYMG		72.30	0.09	0.11	72.40	-0.28	-0.36	ZZ
9CZC6F		72.57	0.36	0.42	72.73	0.05	0.07	ZZ
B4ZV7L		72.00	-0.21	-0.24	73.00	0.32	0.40	ZZ
BG8QRJ		72.02	-0.19	-0.22	72.88	0.20	0.25	ZZ
BK7WDG		71.69	-0.52	-0.60	72.64	-0.04	-0.05	ZZ
CHWA4U		71.50	-0.71	-0.82	72.10	-0.58	-0.74	ZZ
DA2VMG		71.73	-0.48	-0.55	72.32	-0.36	-0.46	ZZ
DDY474		72.50	0.29	0.34	72.60	-0.08	-0.10	ZZ
DPVF8B		71.05	-1.16	-1.34	72.43	-0.25	-0.32	ZZ
DRKJA3		72.30	0.09	0.11	72.60	-0.08	-0.10	ZZ
DTF2C4		72.80	0.59	0.69	73.00	0.32	0.40	ZZ
E6Z6QE		72.37	0.17	0.19	72.08	-0.60	-0.76	ZZ
EAU2KL		72.23	0.02	0.03	73.39	0.71	0.89	ZZ
EC2GLB		71.79	-0.41	-0.48	71.94	-0.74	-0.94	ZZ
FGQC6U		73.32	1.11	1.29	73.57	0.89	1.12	ZZ
FUY2W6		73.44	1.23	1.43	73.67	0.99	1.25	ZZ
G8KWQA		71.98	-0.22	-0.26	71.84	-0.84	-1.07	ZZ
GFUY9G	X	71.20	-1.01	-1.17	70.40	-2.28	-2.88	ZZ
GQF4FF		71.70	-0.51	-0.59	72.30	-0.38	-0.48	ZZ
H69GP9	*	69.61	-2.60	-3.02	70.81	-1.87	-2.37	ZZ
HMCTR6		73.70	1.49	1.73	73.10	0.42	0.53	ZZ
HMRCC3		72.87	0.66	0.77	74.05	1.37	1.73	ZZ
HQB6N6		71.70	-0.51	-0.59	71.99	-0.69	-0.87	ZZ
HV2LZV		72.81	0.60	0.70	73.33	0.65	0.82	ZZ
JKYNPZ		73.00	0.79	0.92	73.20	0.52	0.65	ZZ
JLCBV9	X	71.50	-0.71	-0.82	73.90	1.22	1.54	ZZ
K4NFYC		72.70	0.49	0.57	73.90	1.22	1.54	ZZ
K8NQVC		72.50	0.29	0.34	73.80	1.12	1.41	ZZ
KKVHXJ		72.48	0.27	0.32	73.36	0.68	0.86	ZZ
KNUULG		73.30	1.09	1.27	73.40	0.72	0.91	ZZ
MKN73X		73.00	0.79	0.92	73.40	0.72	0.91	ZZ
MMEBN6		71.90	-0.31	-0.36	73.20	0.52	0.65	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 140  
Tensile Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
NAKD46		72.00	-0.21	-0.24	72.30	-0.38	-0.48	ZZ
NTVAHV		72.00	-0.21	-0.24	72.00	-0.68	-0.86	ZZ
PAYYER		72.26	0.05	0.06	72.41	-0.27	-0.34	ZZ
PD22ZM		72.29	0.08	0.09	72.93	0.24	0.31	ZZ
PUMMMY	*	74.64	2.43	2.81	74.43	1.75	2.21	ZZ
Q4QWY6		72.23	0.02	0.03	72.81	0.13	0.16	ZZ
R86WKN		72.10	-0.11	-0.12	72.30	-0.38	-0.48	ZZ
REJYF4		72.30	0.09	0.11	72.60	-0.08	-0.10	ZZ
RMD74N		71.20	-1.01	-1.17	72.40	-0.28	-0.36	ZZ
RYVHLT		72.00	-0.21	-0.24	72.30	-0.38	-0.48	ZZ
TQWL3A		73.50	1.29	1.50	73.50	0.82	1.03	ZZ
UEUJ76		70.30	-1.91	-2.21	71.50	-1.18	-1.49	ZZ
UV4B9A		72.10	-0.11	-0.12	72.60	-0.08	-0.10	ZZ
UY3PNY		72.93	0.73	0.84	73.61	0.93	1.17	ZZ
VG6NJT		72.30	0.09	0.11	71.90	-0.78	-0.99	ZZ
WAVPJM		73.50	1.29	1.50	74.20	1.52	1.92	ZZ
WQ4ZZU		72.62	0.41	0.47	73.64	0.96	1.21	ZZ
WRH6P6		72.20	-0.01	-0.01	72.20	-0.48	-0.61	ZZ
X2YC2Y		71.50	-0.71	-0.82	72.10	-0.58	-0.74	ZZ
X44XNQ		71.60	-0.60	-0.70	72.67	-0.01	-0.01	ZZ
X79QBX		71.75	-0.46	-0.53	72.71	0.03	0.04	ZZ
XDP79L		71.30	-0.91	-1.05	71.70	-0.98	-1.24	ZZ
XF3TTL		72.20	-0.01	-0.01	73.00	0.32	0.40	ZZ
XJZEFH		70.80	-1.41	-1.63	71.20	-1.48	-1.87	ZZ
XKU6LW		71.90	-0.31	-0.36	72.30	-0.38	-0.48	ZZ
Y7QY4Y		71.20	-1.01	-1.17	71.80	-0.88	-1.11	ZZ
YANKRV		72.81	0.60	0.70	73.68	1.00	1.26	ZZ
YQYZ6W		72.50	0.29	0.34	72.50	-0.18	-0.23	ZZ
YT3VPZ		71.50	-0.71	-0.82	71.20	-1.48	-1.87	ZZ
ZA379W		71.94	-0.27	-0.31	72.04	-0.64	-0.81	ZZ
ZD9LMF		73.64	1.43	1.66	73.56	0.88	1.11	ZZ
ZP33CG		73.00	0.79	0.92	73.00	0.32	0.40	ZZ

Summary Statistics

	Sample P33		Sample P34	
Grand Means	72.21	ksi	72.68	ksi
Std Dev Btwn Labs	0.86	ksi	0.79	ksi

Samples P33 , P34 : AISI 4340

Statistics based on 78 of 81 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 140  
Tensile Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

**Comments on assigned Data Flags for Analysis #140**

WebCode   Flag   Analyst Comment

**2LTF3W**   X   Inconsistent in testing between samples.

**GFUY9G**   X   Data for sample P34 are low. Inconsistent in testing between samples.

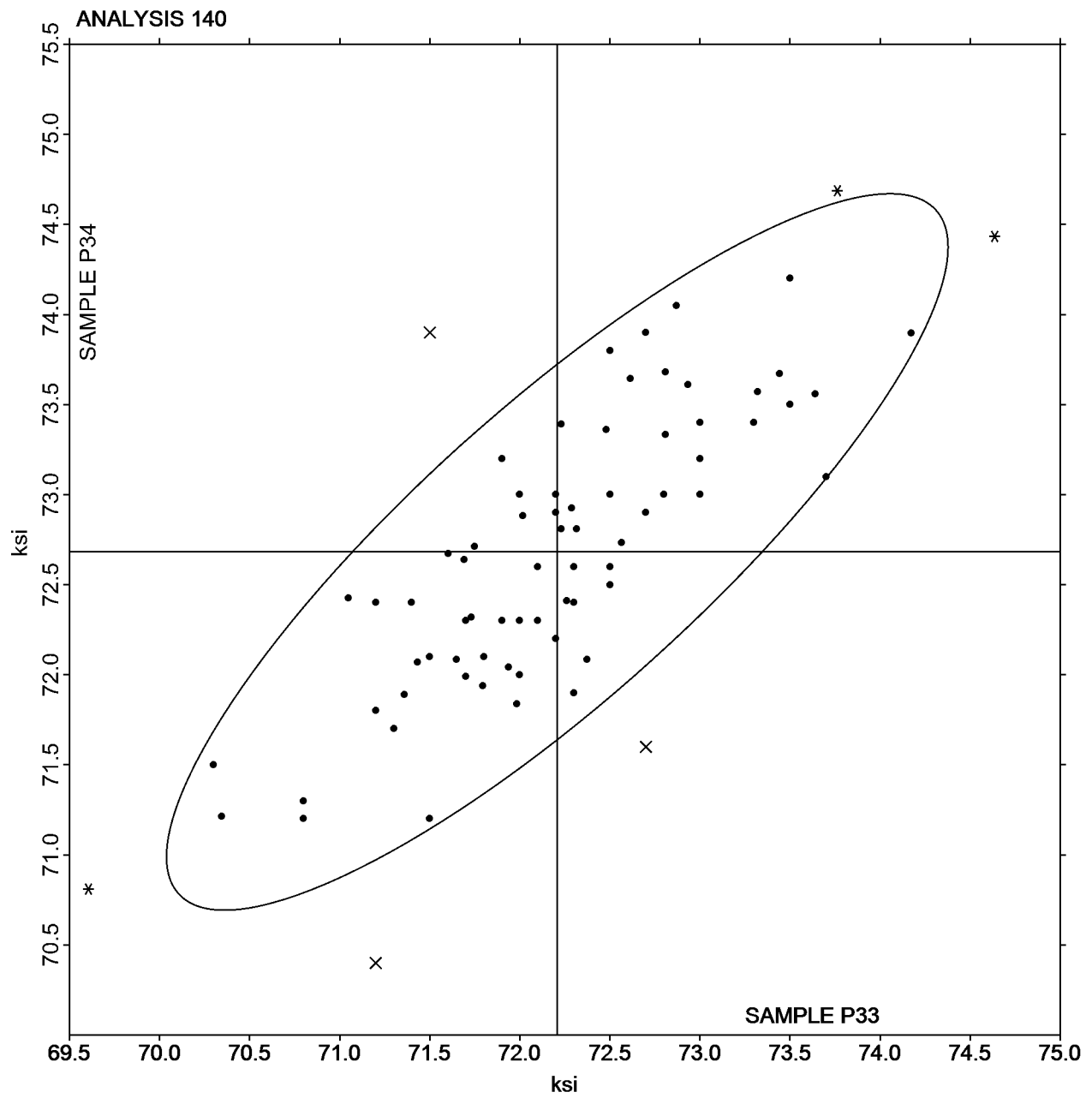
**JLCBV9**   X   Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 140  
Tensile Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

SAMPLE P33  
72.21 ksi

SAMPLE P34  
72.68 ksi





Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 141  
Yield Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24D8UT		44.30	-3.12	-1.03	43.90	-2.75	-1.06	ZZ
26AG8J		54.30	6.88	2.27	50.90	4.25	1.64	ZZ
27F6B3		48.73	1.30	0.43	50.33	3.68	1.42	ZZ
2LTF3W	X	49.50	2.08	0.68	42.70	-3.95	-1.52	ZZ
33WB3U		52.70	5.28	1.74	50.80	4.15	1.60	ZZ
38PFVX		44.96	-2.46	-0.81	46.27	-0.38	-0.15	ZZ
3FL7KE		44.80	-2.62	-0.86	43.60	-3.05	-1.18	ZZ
3HAMUM		51.20	3.78	1.24	48.20	1.55	0.60	ZZ
63N8CM		44.09	-3.33	-1.10	43.51	-3.13	-1.21	ZZ
69CU8R		49.44	2.02	0.66	49.30	2.65	1.02	ZZ
69EMR7		44.00	-3.42	-1.13	44.80	-1.85	-0.71	ZZ
6GRCUL		49.85	2.43	0.80	47.78	1.13	0.44	ZZ
73MDH9	X	46.40	-1.02	-0.34	50.80	4.15	1.60	ZZ
7KNGUX	M	51.36	3.93	1.30	No Data Reported			ZZ
7Q9G8P		45.52	-1.90	-0.63	45.01	-1.64	-0.63	ZZ
87L8PP		43.15	-4.28	-1.41	43.88	-2.77	-1.07	ZZ
88E8TE	*	55.40	7.98	2.63	52.20	5.55	2.14	ZZ
89QYMG		45.40	-2.02	-0.67	45.00	-1.65	-0.64	ZZ
9CZC6F		44.63	-2.79	-0.92	45.88	-0.77	-0.30	ZZ
B4ZV7L		47.00	-0.42	-0.14	46.00	-0.65	-0.25	ZZ
BG8QRJ		46.00	-1.42	-0.47	43.45	-3.20	-1.23	ZZ
BK7WDG		47.89	0.47	0.15	46.79	0.14	0.06	ZZ
CHWA4U		45.30	-2.12	-0.70	45.20	-1.45	-0.56	ZZ
DA2VMG		47.35	-0.07	-0.02	46.03	-0.62	-0.24	ZZ
DDY474		51.80	4.38	1.44	50.10	3.45	1.33	ZZ
DPVF8B		45.87	-1.55	-0.51	46.71	0.06	0.02	ZZ
DRKJA3		51.80	4.38	1.44	48.30	1.65	0.64	ZZ
DTF2C4		50.20	2.78	0.91	50.20	3.55	1.37	ZZ
E6Z6QE		47.14	-0.29	-0.09	46.99	0.35	0.13	ZZ
EAU2KL		44.67	-2.75	-0.91	44.82	-1.83	-0.71	ZZ
EC2GLB	*	53.95	6.53	2.15	49.60	2.96	1.14	ZZ
FGQC6U		50.67	3.25	1.07	51.13	4.48	1.73	ZZ
FUY2W6		52.43	5.01	1.65	50.49	3.85	1.48	ZZ
G8KWQA		42.92	-4.51	-1.48	42.79	-3.86	-1.49	ZZ
GFUY9G		42.10	-5.32	-1.75	40.50	-6.15	-2.37	ZZ
GQF4FF		43.30	-4.12	-1.36	44.00	-2.65	-1.02	ZZ
H69GP9		43.53	-3.90	-1.28	43.05	-3.59	-1.39	ZZ
HMCTR6		46.80	-0.62	-0.21	45.40	-1.25	-0.48	ZZ
HMRCC3		44.79	-2.63	-0.87	44.34	-2.31	-0.89	ZZ
HQB6N6		47.60	0.18	0.06	44.61	-2.04	-0.79	ZZ
HV2LZV		49.07	1.64	0.54	45.72	-0.93	-0.36	ZZ
JKYNPZ		48.50	1.08	0.35	48.20	1.55	0.60	ZZ
JLCBV9		51.90	4.48	1.47	52.10	5.45	2.10	ZZ
K4NFYC		45.20	-2.22	-0.73	46.20	-0.45	-0.17	ZZ
K8NQVC		45.40	-2.02	-0.67	44.40	-2.25	-0.87	ZZ
KKVHXJ		46.35	-1.07	-0.35	45.02	-1.63	-0.63	ZZ
KNUULG		47.80	0.38	0.12	45.60	-1.05	-0.40	ZZ
MKN73X		48.60	1.18	0.39	46.20	-0.45	-0.17	ZZ
MMEBN6		44.00	-3.42	-1.13	44.30	-2.35	-0.91	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 141  
Yield Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
NAKD46		47.40	-0.02	-0.01	49.10	2.45	0.95	ZZ
NTVAHV		52.90	5.48	1.80	49.70	3.05	1.18	ZZ
PAYYER		48.36	0.94	0.31	47.84	1.19	0.46	ZZ
PD22ZM		46.89	-0.53	-0.18	46.66	0.01	0.00	ZZ
PUMMMY		45.15	-2.28	-0.75	44.88	-1.76	-0.68	ZZ
Q4QWY6		44.96	-2.46	-0.81	46.85	0.20	0.08	ZZ
R86WKN		50.40	2.98	0.98	50.00	3.35	1.29	ZZ
REJYF4		46.20	-1.22	-0.40	46.50	-0.15	-0.06	ZZ
RMD74N		45.30	-2.12	-0.70	45.40	-1.25	-0.48	ZZ
RUHNT4		46.38	-1.04	-0.34	46.13	-0.52	-0.20	ZZ
RYVHLT		49.40	1.98	0.65	48.60	1.95	0.75	ZZ
TQWL3A	X	46.70	-0.72	-0.24	50.30	3.65	1.41	ZZ
UEUJ76		42.90	-4.52	-1.49	43.20	-3.45	-1.33	ZZ
UV4B9A		50.50	3.08	1.01	51.00	4.35	1.68	ZZ
UY3PNY		46.37	-1.06	-0.35	45.20	-1.45	-0.56	ZZ
WAVPJM		49.20	1.78	0.59	48.30	1.65	0.64	ZZ
WQ4ZZU		47.19	-0.23	-0.08	46.34	-0.31	-0.12	ZZ
WRH6P6		46.10	-1.32	-0.44	45.90	-0.75	-0.29	ZZ
X2YC2Y		49.60	2.18	0.72	49.60	2.95	1.14	ZZ
X44XNQ		46.75	-0.67	-0.22	45.31	-1.34	-0.52	ZZ
X79QBX		46.29	-1.14	-0.38	45.04	-1.61	-0.62	ZZ
XDP79L		52.30	4.88	1.61	48.50	1.85	0.72	ZZ
XF3TTL		47.80	0.38	0.12	48.50	1.85	0.72	ZZ
XJZEFH		44.30	-3.12	-1.03	43.90	-2.75	-1.06	ZZ
XKU6LW		49.80	2.38	0.78	50.70	4.05	1.56	ZZ
Y7QY4Y		44.50	-2.92	-0.96	43.30	-3.35	-1.29	ZZ
YANKRV		49.75	2.33	0.77	48.15	1.51	0.58	ZZ
YQYZ6W		46.00	-1.42	-0.47	43.80	-2.85	-1.10	ZZ
YT3VPZ		44.30	-3.12	-1.03	42.80	-3.85	-1.48	ZZ
ZA379W		45.34	-2.08	-0.69	45.88	-0.77	-0.30	ZZ
ZD9LMF		49.68	2.25	0.74	48.52	1.87	0.72	ZZ
ZP33CG		47.20	-0.22	-0.07	46.60	-0.05	-0.02	ZZ

Summary Statistics

	Sample P33		Sample P34	
Grand Means	47.42	ksi	46.65	ksi
Std Dev Btwn Labs	3.04	ksi	2.59	ksi

Samples P33 , P34 : AISI 4340

Statistics based on 77 of 81 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 141  
Yield Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

**Comments on assigned Data Flags for Analysis #141**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
2LTF3W	X	Inconsistent in testing between samples.
73MDH9	X	Inconsistent in testing between samples.
7KNGUX	M	Laboratory did not submit data for sample P34.
TQWL3A	X	Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

# Interlaboratory Testing Program for Metals

## Analysis 141

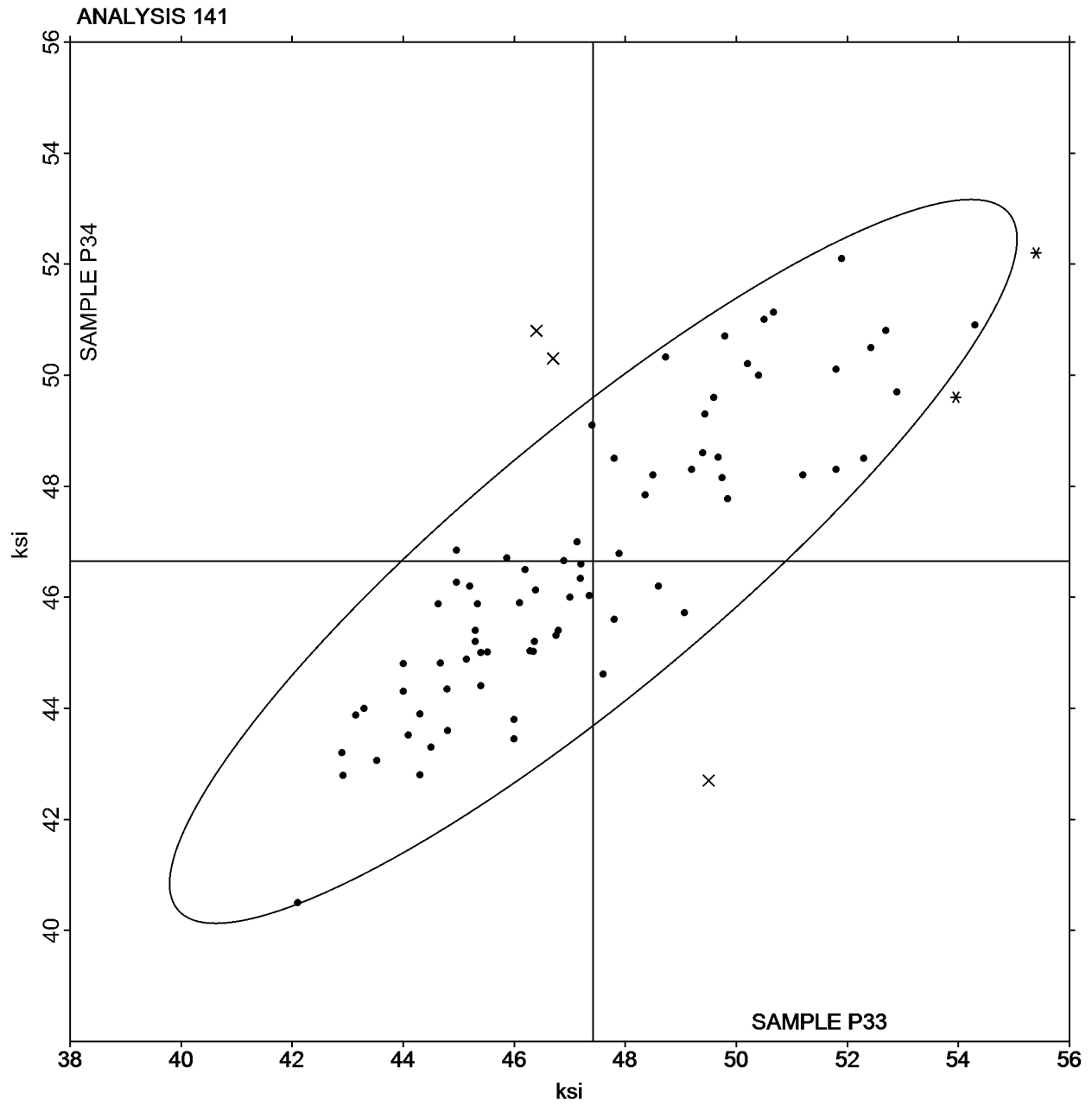
Yield Strength (Lab-Machined Round Steel) - ksi  
ASTM E8

SAMPLE P33

47.42 ksi

SAMPLE P34

46.65 ksi



Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 142

Elongation - (Lab-Machined Round Steel) - Percent Increase

ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24D8UT		35.00	0.41	0.19	34.50	0.29	0.14	ZZ
26AG8J		33.00	-1.59	-0.75	34.00	-0.21	-0.10	ZZ
27F6B3		37.60	3.01	1.41	36.50	2.29	1.11	ZZ
2LTF3W		33.67	-0.92	-0.43	32.40	-1.81	-0.88	ZZ
33WB3U		32.00	-2.59	-1.22	32.00	-2.21	-1.07	ZZ
38PFVX		33.20	-1.39	-0.65	32.40	-1.81	-0.88	ZZ
3FL7KE		34.00	-0.59	-0.28	33.50	-0.71	-0.35	ZZ
3HAMUM		35.80	1.21	0.57	35.60	1.39	0.67	ZZ
63N8CM	X	40.00	5.41	2.54	36.00	1.79	0.87	ZZ
69CU8R		35.50	0.91	0.43	35.50	1.29	0.62	ZZ
69EMR7		38.20	3.61	1.69	37.80	3.59	1.74	ZZ
6GRCUL		32.00	-2.59	-1.22	31.20	-3.01	-1.46	ZZ
73MDH9		33.60	-0.99	-0.47	33.90	-0.31	-0.15	ZZ
7KNGUX	*	39.30	4.71	2.21	37.70	3.49	1.69	ZZ
7Q9G8P		36.60	2.01	0.94	35.60	1.39	0.67	ZZ
87L8PP	X	36.00	1.41	0.66	32.00	-2.21	-1.07	ZZ
88E8TE		34.50	-0.09	-0.04	34.00	-0.21	-0.10	ZZ
89QYMG		36.60	2.01	0.94	35.80	1.59	0.77	ZZ
9CZC6F		32.36	-2.23	-1.05	32.50	-1.71	-0.83	ZZ
B4ZV7L		32.00	-2.59	-1.22	33.00	-1.21	-0.59	ZZ
BG8QRJ		35.50	0.91	0.43	35.45	1.24	0.60	ZZ
BK7WDG		32.50	-2.09	-0.98	31.50	-2.71	-1.31	ZZ
CHWA4U	X	32.50	-2.09	-0.98	28.50	-5.71	-2.77	ZZ
DA2VMG		37.00	2.41	1.13	37.00	2.79	1.35	ZZ
DDY474		32.60	-1.99	-0.93	32.80	-1.41	-0.68	ZZ
DPVF8B		36.60	2.01	0.94	35.95	1.74	0.84	ZZ
DRKJA3		35.00	0.41	0.19	35.00	0.79	0.38	ZZ
DTF2C4		32.50	-2.09	-0.98	32.50	-1.71	-0.83	ZZ
E6Z6QE		32.80	-1.79	-0.84	32.50	-1.71	-0.83	ZZ
EAU2KL	*	38.60	4.01	1.88	39.10	4.89	2.37	ZZ
EC2GLB		35.40	0.81	0.38	34.60	0.39	0.19	ZZ
FGQC6U		32.00	-2.59	-1.22	30.50	-3.71	-1.80	ZZ
FUY2W6		33.12	-1.47	-0.69	32.80	-1.41	-0.68	ZZ
G8KWQA		34.00	-0.59	-0.28	35.00	0.79	0.38	ZZ
GFUY9G	*	31.50	-3.09	-1.45	32.70	-1.51	-0.73	ZZ
GQF4FF		35.70	1.11	0.52	35.00	0.79	0.38	ZZ
H69GP9	X	32.00	-2.59	-1.22	34.30	0.09	0.04	ZZ
HMCTR6		34.00	-0.59	-0.28	34.00	-0.21	-0.10	ZZ
HMRCC3		35.50	0.91	0.43	34.50	0.29	0.14	ZZ
HQB6N6	X	31.50	-3.09	-1.45	34.30	0.09	0.04	ZZ
HV2LZV		34.10	-0.49	-0.23	32.80	-1.41	-0.68	ZZ
JKYNPZ		33.60	-0.99	-0.47	33.70	-0.51	-0.25	ZZ
JLCBV9		35.00	0.41	0.19	34.50	0.29	0.14	ZZ
K4NFYC	*	32.20	-2.39	-1.12	30.40	-3.81	-1.85	ZZ
K8NQVC		31.40	-3.19	-1.50	30.80	-3.41	-1.65	ZZ
KKVHXJ		36.70	2.11	0.99	35.10	0.89	0.43	ZZ
KNUULG	*	29.10	-5.49	-2.58	29.00	-5.21	-2.53	ZZ
MKN73X		33.50	-1.09	-0.51	33.50	-0.71	-0.35	ZZ
MMEBN6		38.00	3.41	1.60	36.80	2.59	1.25	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 142

Elongation - (Lab-Machined Round Steel) - Percent Increase  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
NAKD46		34.60	0.01	0.00	35.40	1.19	0.58	ZZ
NTVAHV		36.00	1.41	0.66	35.00	0.79	0.38	ZZ
PAYYER		34.90	0.31	0.15	34.50	0.29	0.14	ZZ
PD22ZM		34.40	-0.19	-0.09	33.90	-0.31	-0.15	ZZ
PUMMMY		33.00	-1.59	-0.75	33.00	-1.21	-0.59	ZZ
Q4QWY6		37.00	2.41	1.13	36.00	1.79	0.87	ZZ
R86WKN		37.00	2.41	1.13	35.60	1.39	0.67	ZZ
REJYF4		39.30	4.71	2.21	38.00	3.79	1.84	ZZ
RMD74N		29.90	-4.69	-2.20	29.20	-5.01	-2.43	ZZ
RUHNT4		33.00	-1.59	-0.75	32.30	-1.91	-0.93	ZZ
RYVHLT		37.40	2.81	1.32	36.80	2.59	1.25	ZZ
TQWL3A		33.40	-1.19	-0.56	32.70	-1.51	-0.73	ZZ
UEUJ76		34.80	0.21	0.10	34.80	0.59	0.28	ZZ
UV4B9A		33.30	-1.29	-0.61	33.20	-1.01	-0.49	ZZ
UY3PNY		34.80	0.21	0.10	34.30	0.09	0.04	ZZ
WAVPJM		31.50	-3.09	-1.45	30.50	-3.71	-1.80	ZZ
WQ4ZZU		38.00	3.41	1.60	38.00	3.79	1.84	ZZ
WRH6P6		35.30	0.71	0.33	35.30	1.09	0.53	ZZ
X2YC2Y		35.00	0.41	0.19	34.00	-0.21	-0.10	ZZ
X44XNQ		34.55	-0.04	-0.02	34.30	0.09	0.04	ZZ
X79QBX		34.00	-0.59	-0.28	34.00	-0.21	-0.10	ZZ
XDP79L		35.60	1.01	0.47	35.60	1.39	0.67	ZZ
XF3TTL		34.50	-0.09	-0.04	35.50	1.29	0.62	ZZ
XJZEFH		33.40	-1.19	-0.56	32.90	-1.31	-0.64	ZZ
XKU6LW		35.00	0.41	0.19	34.50	0.29	0.14	ZZ
Y7QY4Y		38.12	3.53	1.66	36.83	2.62	1.27	ZZ
YANKRV		37.60	3.01	1.41	37.80	3.59	1.74	ZZ
YQYZ6W		34.00	-0.59	-0.28	34.00	-0.21	-0.10	ZZ
YT3VPZ		34.60	0.01	0.00	34.00	-0.21	-0.10	ZZ
ZA379W		35.20	0.61	0.29	35.60	1.39	0.67	ZZ
ZD9LMF		32.90	-1.69	-0.79	33.20	-1.01	-0.49	ZZ
ZP33CG		34.00	-0.59	-0.28	34.00	-0.21	-0.10	ZZ

Summary Statistics

	Sample P33		Sample P34	
Grand Means	34.59	Percent	34.21	Percent
Std Dev Btwn Labs	2.13	Percent	2.06	Percent

Samples P33 , P34 : AISI 4340

Statistics based on 76 of 81 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 142  
Elongation - (Lab-Machined Round Steel) - Percent Increase  
ASTM E8

**Comments on assigned Data Flags for Analysis #142**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>63N8CM</b>	X	Inconsistent in testing between samples.
<b>87L8PP</b>	X	Inconsistent in testing between samples.
<b>CHWA4U</b>	X	Data for sample P34 are low. Inconsistent in testing between samples.
<b>H69GP9</b>	X	Inconsistent in testing between samples.
<b>HQB6N6</b>	X	Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

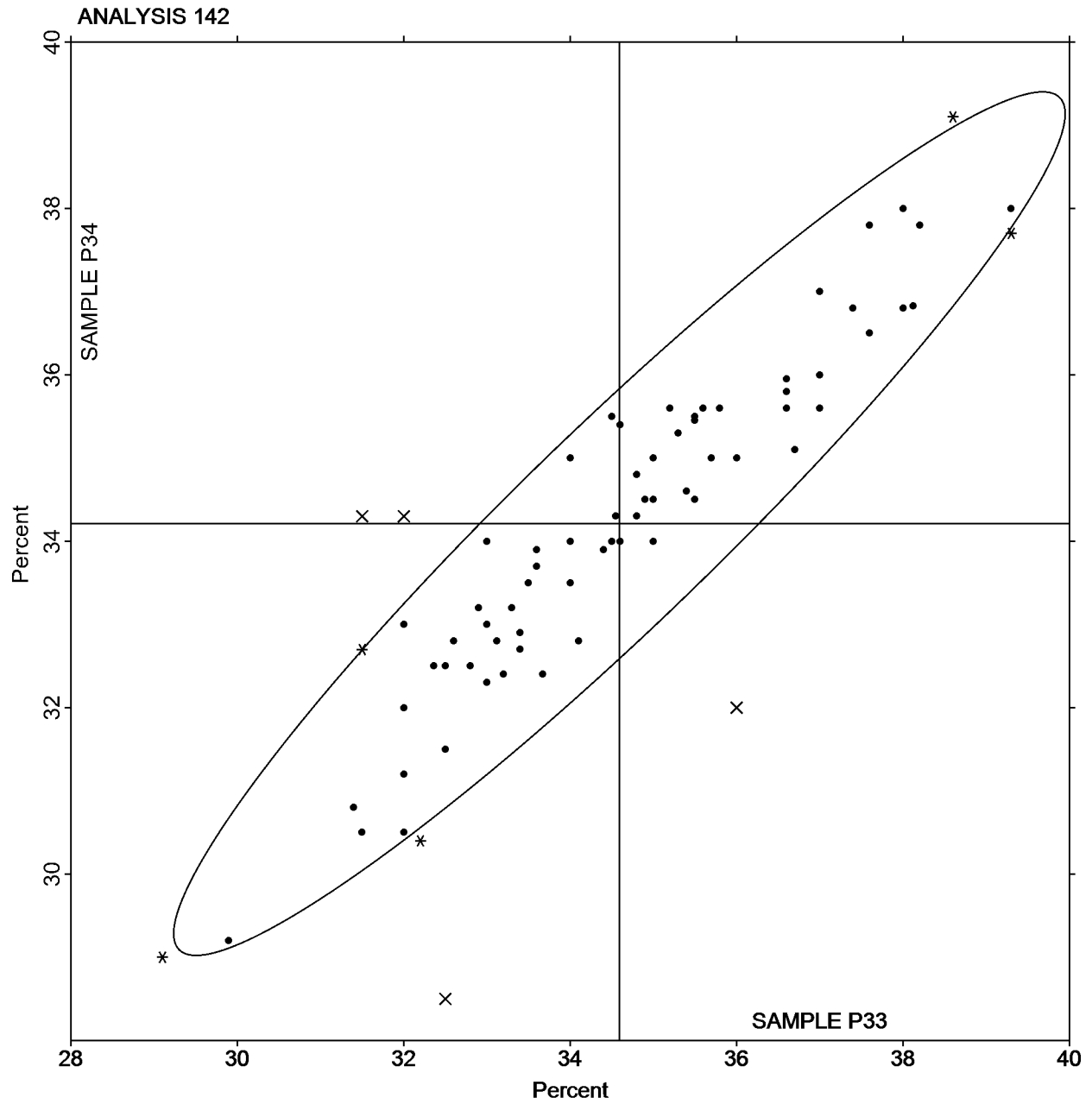
### Interlaboratory Testing Program for Metals

#### Analysis 142

Elongation - (Lab-Machined Round Steel) - Percent Increase  
ASTM E8

SAMPLE P33  
34.59 Percent

SAMPLE P34  
34.21 Percent





Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 143

Reduction of Area (Lab-Machined Round Steel) - Percent  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24D8UT		67.50	0.64	0.78	65.50	0.00	0.00	ZZ
26AG8J	*	65.00	-1.86	-2.26	66.00	0.50	0.47	ZZ
27F6B3		67.60	0.74	0.90	66.50	1.00	0.93	ZZ
2LTF3W		66.00	-0.86	-1.05	63.00	-2.50	-2.31	ZZ
33WB3U		66.50	-0.36	-0.44	66.60	1.10	1.02	ZZ
38PFVX		68.00	1.14	1.39	67.00	1.50	1.39	ZZ
3FL7KE		66.00	-0.86	-1.05	65.00	-0.50	-0.46	ZZ
3HAMUM		67.50	0.64	0.78	65.40	-0.10	-0.09	ZZ
63N8CM		66.20	-0.66	-0.80	65.60	0.10	0.10	ZZ
69CU8R		67.90	1.04	1.26	66.50	1.00	0.93	ZZ
69EMR7		66.60	-0.26	-0.32	66.10	0.60	0.56	ZZ
6GRCUL		66.80	-0.06	-0.07	64.40	-1.10	-1.02	ZZ
73MDH9		65.90	-0.96	-1.17	65.60	0.10	0.10	ZZ
7KNGUX		66.50	-0.36	-0.44	63.90	-1.60	-1.48	ZZ
7Q9G8P		67.00	0.14	0.17	66.00	0.50	0.47	ZZ
87L8PP	X	63.00	-3.86	-4.70	64.00	-1.50	-1.39	ZZ
88E8TE		68.10	1.24	1.51	66.00	0.50	0.47	ZZ
89QYMG		68.10	1.24	1.51	67.00	1.50	1.39	ZZ
9CZC6F		67.40	0.54	0.66	66.20	0.70	0.65	ZZ
B4ZV7L		67.00	0.14	0.17	65.00	-0.50	-0.46	ZZ
BG8QRJ		66.76	-0.10	-0.12	65.88	0.38	0.36	ZZ
BK7WDG		66.40	-0.46	-0.56	63.90	-1.60	-1.48	ZZ
CHWA4U		65.00	-1.86	-2.26	64.90	-0.60	-0.55	ZZ
DDY474		66.50	-0.36	-0.44	65.90	0.40	0.37	ZZ
DPVF8B		65.95	-0.91	-1.11	65.61	0.11	0.11	ZZ
DRKJA3		67.00	0.14	0.17	66.00	0.50	0.47	ZZ
DTF2C4		66.40	-0.46	-0.56	66.40	0.90	0.84	ZZ
E6Z6QE		66.40	-0.46	-0.56	63.20	-2.30	-2.13	ZZ
EAU2KL	X	69.20	2.34	2.85	64.00	-1.50	-1.39	ZZ
EC2GLB		68.20	1.34	1.63	66.30	0.80	0.74	ZZ
FGQC6U		65.90	-0.96	-1.17	65.20	-0.30	-0.27	ZZ
FUY2W6		66.24	-0.62	-0.75	65.32	-0.18	-0.16	ZZ
G8KWQA		67.00	0.14	0.17	64.00	-1.50	-1.39	ZZ
GFUY9G		67.30	0.44	0.53	65.00	-0.50	-0.46	ZZ
H69GP9		67.40	0.54	0.66	65.90	0.40	0.37	ZZ
HMCTR6		67.00	0.14	0.17	66.60	1.10	1.02	ZZ
HMRCC3		65.62	-1.24	-1.51	63.81	-1.69	-1.56	ZZ
HQB6N6		68.59	1.73	2.10	66.05	0.55	0.51	ZZ
HV2LZV		66.80	-0.06	-0.07	65.50	0.00	0.00	ZZ
JKYNPZ		66.30	-0.56	-0.68	64.70	-0.80	-0.74	ZZ
JLCBV9		66.80	-0.06	-0.07	64.40	-1.10	-1.02	ZZ
K4NFYC	X	64.10	-2.76	-3.36	62.10	-3.40	-3.15	ZZ
K8NQVC		66.80	-0.06	-0.07	63.70	-1.80	-1.67	ZZ
KKVHXJ		66.00	-0.86	-1.05	63.00	-2.50	-2.31	ZZ
KNUULG		64.90	-1.96	-2.38	65.10	-0.40	-0.37	ZZ
MKN73X		66.30	-0.56	-0.68	64.10	-1.40	-1.29	ZZ
MMEBN6		67.10	0.24	0.29	67.20	1.70	1.58	ZZ
NAKD46		66.80	-0.06	-0.07	66.20	0.70	0.65	ZZ
NTVAHV		67.10	0.24	0.29	66.30	0.80	0.74	ZZ

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 143

Reduction of Area (Lab-Machined Round Steel) - Percent  
ASTM E8

WebCode	Data Flag	Sample P33			Sample P34			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
PAYYER		66.90	0.04	0.05	63.20	-2.30	-2.13	ZZ
PD22ZM		66.70	-0.16	-0.19	65.70	0.20	0.19	ZZ
PUMMMY		67.00	0.14	0.17	66.00	0.50	0.47	ZZ
Q4QWY6		67.00	0.14	0.17	66.00	0.50	0.47	ZZ
R86WKN		65.40	-1.46	-1.78	65.90	0.40	0.37	ZZ
REJYF4		65.90	-0.96	-1.17	63.50	-2.00	-1.85	ZZ
RMD74N		68.00	1.14	1.39	64.50	-1.00	-0.92	ZZ
RUHNT4		66.70	-0.16	-0.19	65.30	-0.20	-0.18	ZZ
RYVHLT		68.10	1.24	1.51	67.10	1.60	1.49	ZZ
TQWL3A		66.60	-0.26	-0.32	63.80	-1.70	-1.57	ZZ
UEUJ76	X	63.00	-3.86	-4.70	66.70	1.20	1.12	ZZ
UV4B9A		67.40	0.54	0.66	66.30	0.80	0.74	ZZ
UY3PNY	*	69.20	2.34	2.85	66.60	1.10	1.02	ZZ
WAVPJM		66.40	-0.46	-0.56	66.00	0.50	0.47	ZZ
WQ4ZZU	X	69.00	2.14	2.60	69.00	3.50	3.25	ZZ
WRH6P6		66.80	-0.06	-0.07	66.10	0.60	0.56	ZZ
X2YC2Y		66.60	-0.26	-0.32	65.70	0.20	0.19	ZZ
X44XNQ		67.12	0.26	0.32	65.72	0.22	0.21	ZZ
X79QBX		66.00	-0.86	-1.05	65.00	-0.50	-0.46	ZZ
XDP79L		66.90	0.04	0.05	67.00	1.50	1.39	ZZ
XF3TTL		67.70	0.84	1.02	67.20	1.70	1.58	ZZ
XJZEFH		67.80	0.94	1.14	66.50	1.00	0.93	ZZ
XKU6LW		67.00	0.14	0.17	65.00	-0.50	-0.46	ZZ
Y7QY4Y		67.00	0.14	0.17	65.00	-0.50	-0.46	ZZ
YANKRV		67.52	0.66	0.80	66.96	1.46	1.36	ZZ
YQYZ6W		67.00	0.14	0.17	66.00	0.50	0.47	ZZ
YT3VPZ		68.00	1.14	1.39	65.50	0.00	0.00	ZZ
ZA379W		66.90	0.04	0.05	66.20	0.70	0.65	ZZ
ZD9LMF	X	63.60	-3.26	-3.97	63.80	-1.70	-1.57	ZZ
ZP33CG		67.00	0.14	0.17	66.00	0.50	0.47	ZZ

Summary Statistics

	Sample P33		Sample P34	
Grand Means	66.86	Percent	65.50	Percent
Std Dev Btwn Labs	0.82	Percent	1.08	Percent

Samples P33 , P34 : AISI 4340

Statistics based on 73 of 79 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 143  
Reduction of Area (Lab-Machined Round Steel) - Percent  
ASTM E8

**Comments on assigned Data Flags for Analysis #143**

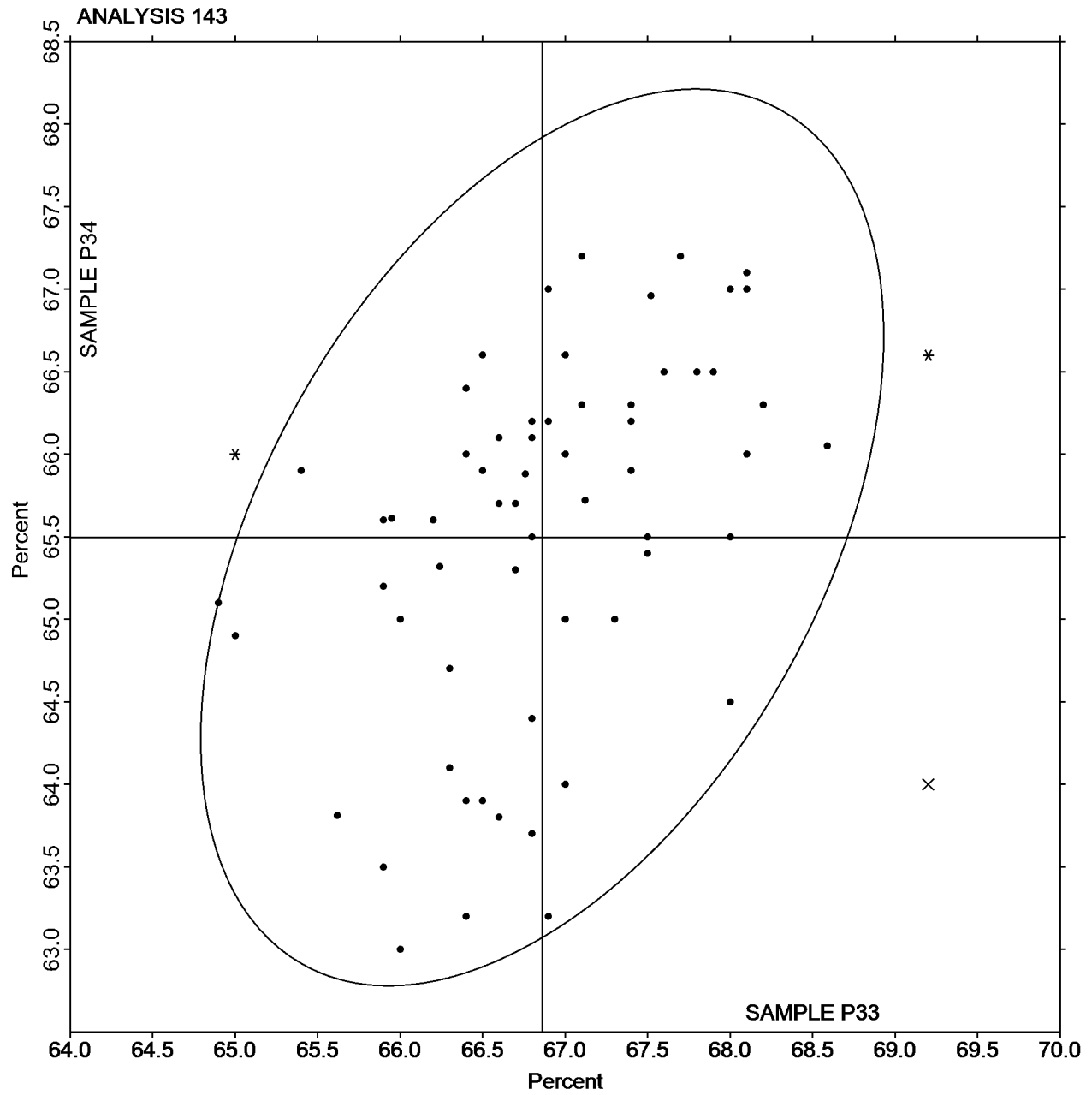
<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>87L8PP</b>	X	Data for sample P33 are low.
<b>EAU2KL</b>	X	Data for sample P33 are high.
<b>K4NFYC</b>	X	Data for both samples are low.
<b>UEUJ76</b>	X	Data for sample P33 are low.
<b>WQ4ZZU</b>	X	Data for sample P34 are high.
<b>ZD9LMF</b>	X	Data for sample P33 are low.

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 143  
Reduction of Area (Lab-Machined Round Steel) - Percent  
ASTM E8

SAMPLE P33  
66.86 Percent

SAMPLE P34  
65.50 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 170

Chemical Analysis Element #1 - Carbon & Low Alloy Steel - Percent  
CARBON (C)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.4010	-0.0034	-0.54	0.2990	-0.0019	-0.33	CI
2BTRET		0.3963	-0.0081	-1.27	0.2973	-0.0036	-0.61	CO
2F36WR		0.4175	0.0130	2.04	0.3125	0.0116	1.96	OE
38PFVX		0.4067	0.0022	0.35	0.3017	0.0007	0.13	CI
3CZJGL	X	0.3930	-0.0114	-1.79	0.2760	-0.0249	-4.23	AE
3UZGXV		0.4005	-0.0039	-0.61	0.3010	0.0000	0.01	OE
4M289H		0.4001	-0.0043	-0.68	0.3001	-0.0008	-0.13	OE
4NAJNY		0.3977	-0.0068	-1.06	0.2963	-0.0046	-0.78	OE
4VQ34R		0.4069	0.0025	0.38	0.3046	0.0037	0.62	OE
4WMBFH		0.4131	0.0087	1.36	0.2969	-0.0040	-0.68	OE
4YTYJY		0.4067	0.0022	0.35	0.2987	-0.0023	-0.38	OE
66DAEE		0.4150	0.0106	1.65	0.3113	0.0104	1.77	GD
6GVUYB		0.4033	-0.0011	-0.17	0.3033	0.0024	0.41	OE
6V7LNP		0.4020	-0.0024	-0.38	0.3040	0.0031	0.52	OE
6XFP7R		0.4073	0.0029	0.45	0.3033	0.0024	0.41	CI
736KPB		0.4007	-0.0038	-0.59	0.2920	-0.0089	-1.52	OE
78VWHL		0.4049	0.0004	0.07	0.2924	-0.0085	-1.44	OE
7MA7CP		0.3950	-0.0094	-1.48	0.2960	-0.0049	-0.84	CI
87L8PP	*	0.3873	-0.0171	-2.68	0.2857	-0.0153	-2.59	OE
89PW44		0.4010	-0.0034	-0.54	0.3033	0.0024	0.41	GD
8ALF76		0.4013	-0.0031	-0.49	0.3017	0.0007	0.13	CI
8C7AZK		0.4127	0.0082	1.29	0.3033	0.0024	0.41	OE
8EUYVD		0.4056	0.0012	0.18	0.3045	0.0036	0.61	OE
8TW9YM		0.4040	-0.0004	-0.07	0.3017	0.0007	0.13	CI
8XPCNK		0.4010	-0.0034	-0.54	0.3000	-0.0009	-0.16	CI
8ZBDK6		0.4170	0.0126	1.96	0.3073	0.0064	1.09	OE
9C4UA7		0.4052	0.0007	0.11	0.2963	-0.0046	-0.78	OE
9U3DPF		0.4112	0.0067	1.06	0.3055	0.0046	0.78	AE
9YGUAQ		0.4052	0.0007	0.11	0.2962	-0.0047	-0.80	OE
9ZBF4H		0.4110	0.0066	1.03	0.3043	0.0034	0.58	CI
AAV8ZL		0.4080	0.0036	0.56	0.3027	0.0017	0.30	OE
AJH6UK		0.3983	-0.0061	-0.96	0.2950	-0.0059	-1.00	CI
ATMD7Q		0.4000	-0.0044	-0.70	0.2997	-0.0013	-0.21	OE
BQELJG		0.4033	-0.0011	-0.17	0.3027	0.0017	0.30	OE
BUDWFF		0.4037	-0.0008	-0.12	0.3050	0.0041	0.69	CO
C6A2FG		0.4045	0.0001	0.01	0.2950	-0.0060	-1.01	OE
CBE463		0.4057	0.0012	0.19	0.3063	0.0054	0.92	CO
CJRUGZ		0.4183	0.0138	2.17	0.3119	0.0110	1.86	OE
CPXKHZ		0.4067	0.0022	0.35	0.3043	0.0034	0.58	OE
CTW4E7		0.4013	-0.0032	-0.50	0.2998	-0.0011	-0.19	OE
DKLZXM		0.4070	0.0026	0.40	0.3040	0.0031	0.52	OE
DKXXXA		0.4147	0.0102	1.60	0.3049	0.0040	0.68	OE
DMRKN8		0.4140	0.0096	1.50	0.3001	-0.0009	-0.15	OE
DQQYAC	*	0.4183	0.0139	2.17	0.3010	0.0001	0.01	OE
DTF2C4		0.4150	0.0106	1.65	0.3100	0.0091	1.54	CO
E3VH94		0.4053	0.0009	0.14	0.3037	0.0027	0.46	OE
E6Z6QE		0.4000	-0.0044	-0.70	0.2963	-0.0046	-0.78	OE
EBPJMM		0.4023	-0.0021	-0.34	0.3064	0.0055	0.93	CI
EFYZVC		0.4150	0.0106	1.65	0.3053	0.0044	0.75	XX

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 170

Chemical Analysis Element #1 - Carbon & Low Alloy Steel - Percent  
CARBON (C)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EMLPH8		0.4105	0.0060	0.94	0.3001	-0.0008	-0.14	OE
EVBGTQ		0.4087	0.0042	0.66	0.3000	-0.0010	-0.16	OE
EYCJRF		0.4030	-0.0014	-0.23	0.3067	0.0057	0.97	OE
FVTQJ7	*	0.4150	0.0106	1.65	0.3160	0.0151	2.56	GD
G8KWQA		0.4077	0.0032	0.50	0.3003	-0.0006	-0.10	CI
GLJL7F		0.3983	-0.0061	-0.96	0.2893	-0.0116	-1.97	OE
GUU42Y		0.4080	0.0036	0.56	0.3053	0.0044	0.75	CO
HV2LZV		0.4073	0.0029	0.45	0.3007	-0.0003	-0.04	CI
HVLGBK		0.4082	0.0038	0.59	0.3039	0.0030	0.50	OE
JF4URY		0.4047	0.0002	0.04	0.2987	-0.0023	-0.38	OE
JKYNPZ		0.3987	-0.0058	-0.90	0.2913	-0.0096	-1.63	OE
JM67NV		0.4018	-0.0026	-0.41	0.3026	0.0017	0.28	OE
JR3M3B		0.4000	-0.0044	-0.70	0.2967	-0.0043	-0.72	OE
JTCTD7		0.4107	0.0062	0.97	0.2883	-0.0126	-2.14	OE
K4RZPZ		0.4107	0.0062	0.97	0.3040	0.0031	0.52	OE
KLQZYK		0.3973	-0.0071	-1.11	0.2930	-0.0079	-1.35	OE
KM7DDU		0.4103	0.0059	0.92	0.2993	-0.0016	-0.27	OE
KRXP6K	X	0.3387	-0.0658	-10.29	0.2320	-0.0689	-11.70	XX
KWRJ68		0.3935	-0.0110	-1.72	0.2933	-0.0076	-1.30	OE
LCGVJA		0.4006	-0.0039	-0.61	0.3020	0.0011	0.18	OE
LCW84Z		0.4030	-0.0014	-0.23	0.3000	-0.0009	-0.16	CI
M3RPUU		0.4063	0.0019	0.30	0.3060	0.0051	0.86	CI
MKN73X		0.4150	0.0106	1.65	0.3073	0.0064	1.09	OE
MUWJD2		0.3957	-0.0088	-1.37	0.3033	0.0024	0.41	OE
N4H4YX		0.4033	-0.0012	-0.18	0.3017	0.0008	0.14	OE
NBWWAU		0.4062	0.0017	0.27	0.3004	-0.0005	-0.08	OE
NFQ4EN		0.3940	-0.0105	-1.64	0.2969	-0.0040	-0.68	OE
NMUXMX		0.4010	-0.0034	-0.54	0.2940	-0.0069	-1.18	OE
NTVAHV		0.4057	0.0012	0.19	0.3110	0.0101	1.71	OE
NVNX6W		0.4017	-0.0028	-0.43	0.3050	0.0041	0.69	CI
P69Q2Z		0.4083	0.0039	0.61	0.3023	0.0014	0.24	OE
PAH4JY		0.3928	-0.0117	-1.83	0.2965	-0.0044	-0.74	OE
PCLHFP	X	0.3817	-0.0228	-3.56	0.2843	-0.0166	-2.82	GD
PHRE2B		0.3983	-0.0061	-0.96	0.2890	-0.0119	-2.03	AE
PHWPT3		0.3880	-0.0164	-2.57	0.3030	0.0021	0.35	CO
PPD8DB		0.3973	-0.0071	-1.11	0.3017	0.0007	0.13	GD
PUMMMY		0.3958	-0.0086	-1.35	0.3014	0.0004	0.07	OE
Q4QWY6		0.4053	0.0009	0.14	0.3033	0.0024	0.41	DR
Q9ZFNB		0.4009	-0.0036	-0.56	0.3027	0.0018	0.30	OE
QHN98A		0.4027	-0.0018	-0.28	0.3023	0.0014	0.24	OE
QPCV3E		0.3942	-0.0102	-1.60	0.2903	-0.0106	-1.80	OE
QU6RR7		0.4105	0.0061	0.95	0.3007	-0.0002	-0.03	OE
RYR2E9		0.3987	-0.0058	-0.90	0.2963	-0.0046	-0.78	OE
T9WAU9		0.3995	-0.0049	-0.77	0.3057	0.0048	0.82	OE
TFBGX4		0.4051	0.0006	0.10	0.2996	-0.0013	-0.23	OE
U9U6HH	*	0.3900	-0.0144	-2.26	0.3000	-0.0009	-0.16	GD
U9VYDW		0.4080	0.0035	0.55	0.3040	0.0031	0.53	OE
UAQGEX		0.3990	-0.0054	-0.85	0.2897	-0.0113	-1.91	AE
UY3PNY		0.4083	0.0039	0.61	0.3030	0.0021	0.35	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 170

Chemical Analysis Element #1 - Carbon & Low Alloy Steel - Percent  
CARBON (C)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UZDQHX		0.3980	-0.0064	-1.01	0.2923	-0.0086	-1.46	OE
V9NB83		0.3955	-0.0089	-1.40	0.2946	-0.0064	-1.08	OE
VAKJJT		0.4013	-0.0031	-0.49	0.3013	0.0004	0.07	OE
VBF3LU		0.4050	0.0006	0.09	0.3000	-0.0009	-0.16	CI
VF7JVY		0.3991	-0.0053	-0.83	0.2922	-0.0088	-1.49	OE
VPBQBY		0.4010	-0.0034	-0.54	0.2990	-0.0019	-0.33	OE
VYXN7J		0.4100	0.0056	0.87	0.3053	0.0044	0.75	OE
VZVYDU		0.4193	0.0149	2.33	0.3053	0.0044	0.75	OE
WAVPJM	*	0.4077	0.0032	0.50	0.2903	-0.0106	-1.80	OE
WLA3B3		0.4060	0.0016	0.24	0.3080	0.0071	1.20	OE
WRH6P6	X	0.4157	0.0112	1.76	0.3225	0.0215	3.66	CO
WUNL4N		0.4093	0.0049	0.77	0.3000	-0.0009	-0.16	OE
WYJDCK		0.3967	-0.0078	-1.22	0.2867	-0.0143	-2.42	OE
WZP48T		0.4167	0.0122	1.91	0.3130	0.0121	2.05	GD
X79QBX	X	0.3840	-0.0204	-3.20	0.2850	-0.0159	-2.70	AE
XELLJ		0.4033	-0.0011	-0.17	0.2930	-0.0079	-1.35	OE
XRAHYP		0.4023	-0.0021	-0.33	0.3010	0.0001	0.01	XX
Y7P7AK		0.4100	0.0056	0.87	0.3110	0.0101	1.71	OE
YQYZ6W		0.4067	0.0022	0.35	0.3047	0.0037	0.63	GD
YW38KZ	*	0.4013	-0.0031	-0.49	0.3127	0.0117	1.99	OE
ZD9LMF		0.4100	0.0056	0.87	0.3100	0.0091	1.54	CI
ZPXLEH		0.4030	-0.0014	-0.23	0.2913	-0.0096	-1.63	OE
ZRNQZP		0.4003	-0.0041	-0.64	0.3030	0.0021	0.35	OE
ZTV68V		0.4013	-0.0031	-0.49	0.3020	0.0011	0.18	OE
ZVM6AK		0.4023	-0.0021	-0.33	0.2987	-0.0023	-0.38	CI

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.4044	Percent	0.3009	Percent
Std Dev Btwn Labs	0.0064	Percent	0.0059	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 116 of 123 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 170  
Chemical Analysis Element #1 - Carbon & Low Alloy Steel - Percent  
CARBON (C)

**Comments on assigned Data Flags for Analysis #170**

WebCode   Flag   Analyst Comment

**3CZJGL**   X   Data for sample L34 are low. Inconsistent within the determinations of both samples.

**KRXP6K**   X   Data for both samples are low.

**PCLHFP**   X   Data for both samples are low.

**WRH6P6**   X   Data for sample L34 are high.

**X79QBX**   X   Data for sample L33 are low.



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1st Q, 2016

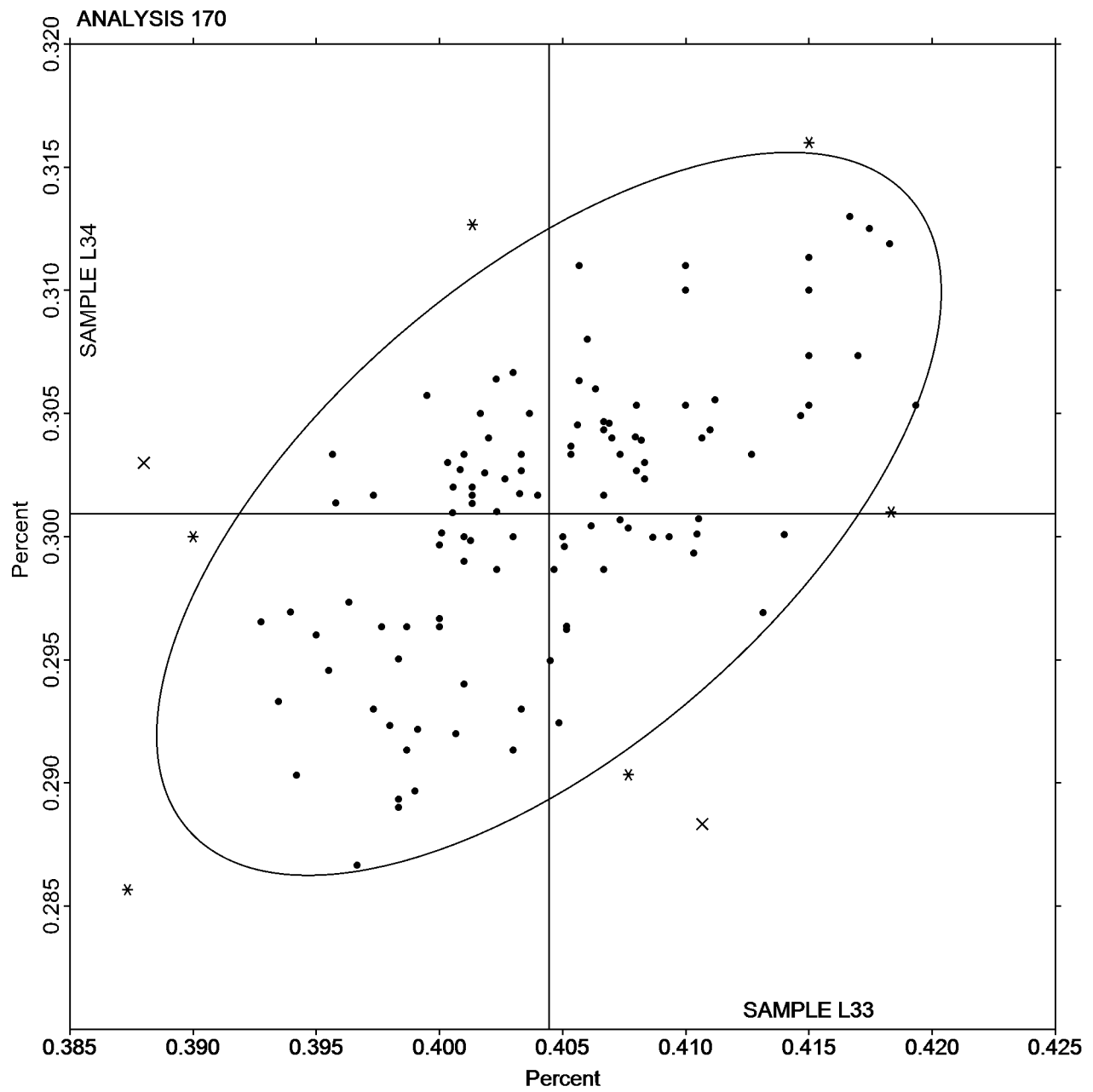
### Interlaboratory Testing Program for Metals

#### Analysis 170

Chemical Analysis Element #1 - Carbon & Low Alloy Steel - Percent  
CARBON (C)

SAMPLE L33  
0.4044 Percent

SAMPLE L34  
0.3009 Percent



Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 171

Chemical Analysis Element #2 - Carbon & Low Alloy Steel - Percent  
MANGANESE (Mn)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.6977	0.0075	0.75	0.8443	0.0155	1.22	IC
2BTRET		0.6938	0.0037	0.37	0.8183	-0.0105	-0.83	XX
2F36WR		0.6855	-0.0046	-0.47	0.8243	-0.0045	-0.36	OE
38PFVX		0.6907	0.0005	0.05	0.8327	0.0039	0.30	OE
3CZJGL		0.7027	0.0125	1.25	0.8460	0.0172	1.35	AE
3UZGXV		0.6910	0.0008	0.08	0.8223	-0.0065	-0.51	OE
4M289H		0.6924	0.0023	0.23	0.8239	-0.0049	-0.38	OE
4NAJNY		0.6943	0.0042	0.42	0.8347	0.0059	0.46	OE
4VQ34R	*	0.6842	-0.0060	-0.60	0.8455	0.0167	1.31	OE
4WMBFH		0.6747	-0.0154	-1.54	0.8118	-0.0170	-1.34	OE
4YTYJY		0.6837	-0.0065	-0.65	0.8233	-0.0055	-0.43	OE
66DAEE		0.6947	0.0045	0.45	0.8360	0.0072	0.57	IC
6GVUYB	*	0.7100	0.0199	1.99	0.8333	0.0045	0.36	OE
6V7LNP		0.6923	0.0022	0.22	0.8393	0.0105	0.83	OE
6XFP7R		0.6907	0.0005	0.05	0.8293	0.0005	0.04	OE
736KPB		0.6900	-0.0001	-0.01	0.8233	-0.0055	-0.43	OE
78VWHL		0.6837	-0.0064	-0.65	0.8130	-0.0158	-1.24	OE
7MA7CP		0.6867	-0.0034	-0.34	0.8262	-0.0026	-0.20	IC
87L8PP		0.6833	-0.0068	-0.68	0.8113	-0.0175	-1.37	OE
89PW44	*	0.6687	-0.0215	-2.15	0.8240	-0.0048	-0.38	GD
8ALF76		0.6803	-0.0098	-0.98	0.8246	-0.0042	-0.33	OE
8AWK8M		0.7017	0.0115	1.15	0.8447	0.0159	1.25	OE
8C7AZK		0.6797	-0.0105	-1.05	0.8170	-0.0118	-0.93	OE
8EUYVD		0.6919	0.0017	0.17	0.8220	-0.0068	-0.53	OE
8TW9YM		0.6990	0.0089	0.89	0.8393	0.0105	0.83	IC
8XPCNK		0.7127	0.0225	2.25	0.8533	0.0245	1.93	AA
8ZBDK6		0.7100	0.0199	1.99	0.8600	0.0312	2.46	OE
9C4UA7		0.6784	-0.0118	-1.18	0.8147	-0.0141	-1.11	OE
9U3DPF		0.6946	0.0044	0.44	0.8341	0.0053	0.42	AE
9YGUAQ		0.6909	0.0008	0.08	0.8260	-0.0028	-0.22	OE
9ZBF4H		0.6933	0.0032	0.32	0.8183	-0.0105	-0.82	OE
A3ADQF		0.6840	-0.0061	-0.62	0.8173	-0.0115	-0.90	OE
AAV8ZL		0.6907	0.0005	0.05	0.8393	0.0105	0.83	OE
AJH6UK		0.6921	0.0020	0.20	0.8337	0.0049	0.39	OE
ATMD7Q		0.6890	-0.0011	-0.11	0.8313	0.0025	0.20	OE
BQELJG		0.6933	0.0032	0.32	0.8360	0.0072	0.57	OE
BUDWFF		0.6853	-0.0048	-0.48	0.8413	0.0125	0.99	OE
C6A2FG		0.6907	0.0006	0.06	0.8291	0.0003	0.02	OE
CBE463	*	0.6840	-0.0061	-0.62	0.8010	-0.0278	-2.19	OE
CJRUZG	*	0.7096	0.0195	1.95	0.8623	0.0335	2.63	OE
CPXKHZ		0.6883	-0.0018	-0.18	0.8330	0.0042	0.33	OE
CTW4E7		0.6884	-0.0017	-0.17	0.8306	0.0018	0.14	OE
DA2VMG		0.6870	-0.0031	-0.31	0.8220	-0.0068	-0.54	OE
DKLZXM		0.6827	-0.0075	-0.75	0.8327	0.0039	0.30	OE
DKXXXA		0.6771	-0.0130	-1.31	0.8079	-0.0209	-1.64	OE
DMRKN8		0.6817	-0.0084	-0.85	0.8188	-0.0100	-0.79	OE
DQQYAC	X	0.7200	0.0299	2.99	0.8767	0.0479	3.77	OE
DTF2C4		0.6800	-0.0101	-1.02	0.8350	0.0062	0.49	IC
E3VH94		0.6900	-0.0001	-0.01	0.8133	-0.0155	-1.22	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 171

Chemical Analysis Element #2 - Carbon & Low Alloy Steel - Percent  
MANGANESE (Mn)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
E6Z6QE		0.6850	-0.0051	-0.52	0.8243	-0.0045	-0.35	OE
EBPJMM		0.6900	-0.0001	-0.01	0.8367	0.0079	0.62	AE
EFYZVC		0.6840	-0.0061	-0.62	0.8303	0.0015	0.12	XX
EMLPH8		0.6839	-0.0062	-0.62	0.8207	-0.0081	-0.63	OE
EVBGTQ		0.6945	0.0044	0.44	0.8298	0.0010	0.08	OE
EYCJRF		0.6880	-0.0021	-0.21	0.8347	0.0059	0.46	OE
EZQT2F		0.6803	-0.0098	-0.98	0.8203	-0.0085	-0.67	OE
FVTQJ7		0.6967	0.0065	0.65	0.8327	0.0039	0.30	GD
G8KWQA		0.6870	-0.0031	-0.31	0.8310	0.0022	0.17	DR
GLJL7F		0.6767	-0.0135	-1.35	0.8033	-0.0255	-2.00	OE
GUU42Y		0.6770	-0.0131	-1.32	0.8167	-0.0121	-0.95	OE
HV2LZV		0.6900	-0.0001	-0.01	0.8260	-0.0028	-0.22	WD
HVLGBK	*	0.7181	0.0280	2.80	0.8493	0.0205	1.61	OE
JF4URY		0.6957	0.0055	0.55	0.8340	0.0052	0.41	OE
JKYNPZ		0.6950	0.0049	0.49	0.8280	-0.0008	-0.06	OE
JM67NV		0.6848	-0.0053	-0.53	0.8280	-0.0008	-0.07	OE
JR3M3B		0.7010	0.0109	1.09	0.8380	0.0092	0.72	OE
JTCTD7	*	0.7010	0.0109	1.09	0.8177	-0.0111	-0.88	OE
K4RZPZ		0.6934	0.0033	0.33	0.8270	-0.0018	-0.14	OE
KLQZYK		0.6963	0.0062	0.62	0.8333	0.0045	0.36	OE
KM7DDU		0.6830	-0.0071	-0.72	0.8120	-0.0168	-1.32	OE
KRXP6K		0.6940	0.0039	0.39	0.8330	0.0042	0.33	XX
KWRJ68		0.6879	-0.0022	-0.22	0.8269	-0.0019	-0.15	OE
LCGVJA		0.6911	0.0009	0.09	0.8257	-0.0031	-0.24	OE
LCW84Z		0.6907	0.0005	0.05	0.8360	0.0072	0.57	OE
M3RPUU		0.6960	0.0059	0.59	0.8373	0.0085	0.67	IC
MKN73X	*	0.7200	0.0299	2.99	0.8563	0.0275	2.17	OE
MUWJD2		0.6833	-0.0068	-0.68	0.8367	0.0079	0.62	OE
N4H4YX		0.6874	-0.0028	-0.28	0.8281	-0.0007	-0.06	OE
NBWWAU		0.6862	-0.0040	-0.40	0.8331	0.0043	0.34	OE
NFQ4EN		0.6934	0.0032	0.32	0.8312	0.0024	0.19	OE
NMUXMX		0.6827	-0.0075	-0.75	0.8180	-0.0108	-0.85	OE
NTVAHV	X	0.7190	0.0289	2.89	0.8397	0.0109	0.86	OE
NVNX6W		0.6920	0.0019	0.19	0.8247	-0.0041	-0.33	WD
P69Q2Z	*	0.7203	0.0302	3.02	0.8617	0.0329	2.59	OE
PAH4JY		0.6966	0.0065	0.65	0.8425	0.0137	1.08	OE
PCLHFP		0.6737	-0.0165	-1.65	0.8000	-0.0288	-2.27	GD
PHRE2B		0.6777	-0.0125	-1.25	0.8120	-0.0168	-1.32	AE
PHWPT3	X	0.6500	-0.0401	-4.02	0.8400	0.0112	0.88	OE
PPD8DB	*	0.6657	-0.0245	-2.45	0.8120	-0.0168	-1.32	GD
PUMMMY		0.6879	-0.0023	-0.23	0.8400	0.0112	0.88	OE
Q4QWY6		0.6783	-0.0118	-1.18	0.8267	-0.0021	-0.17	DR
Q9ZFNB		0.6941	0.0039	0.39	0.8357	0.0069	0.54	OE
QHN98A		0.6920	0.0019	0.19	0.8283	-0.0005	-0.04	OE
QPCV3E		0.6841	-0.0060	-0.61	0.8191	-0.0097	-0.76	OE
QU6RR7		0.6949	0.0047	0.47	0.8276	-0.0012	-0.09	OE
RYR2E9		0.6827	-0.0075	-0.75	0.8230	-0.0058	-0.46	OE
T9WAU9		0.6853	-0.0048	-0.48	0.8250	-0.0038	-0.30	OE
TFBGX4		0.6905	0.0003	0.03	0.8306	0.0018	0.14	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 171

Chemical Analysis Element #2 - Carbon & Low Alloy Steel - Percent  
MANGANESE (Mn)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
U9U6HH	X	0.7300	0.0399	3.99	0.8633	0.0345	2.72	GD
U9VYDW		0.6902	0.0001	0.01	0.8208	-0.0080	-0.63	OE
UAQGEX		0.6783	-0.0118	-1.18	0.8120	-0.0168	-1.32	AE
UY3PNY	*	0.7050	0.0149	1.49	0.8267	-0.0021	-0.17	OE
UZDQHX		0.6960	0.0059	0.59	0.8390	0.0102	0.80	OE
V9NB83	X	0.3892	-0.3010	-30.12	0.3027	-0.5261	-41.40	OE
VAKJJT	*	0.7137	0.0235	2.35	0.8623	0.0335	2.64	OE
VBF3LU		0.6930	0.0029	0.29	0.8280	-0.0008	-0.06	OE
VF7JVY		0.6889	-0.0012	-0.12	0.8300	0.0012	0.10	OE
VLYJDZ		0.6880	-0.0021	-0.21	0.8293	0.0005	0.04	OE
VPBQBY		0.6920	0.0019	0.19	0.8307	0.0019	0.15	OE
VYXN7J		0.6980	0.0079	0.79	0.8270	-0.0018	-0.14	OE
VZVYDU		0.6977	0.0075	0.75	0.8317	0.0029	0.23	OE
WAVPJM		0.6887	-0.0015	-0.15	0.8177	-0.0111	-0.88	IC
WLA3B3		0.6937	0.0035	0.35	0.8330	0.0042	0.33	OE
WRH6P6		0.6917	0.0016	0.16	0.8246	-0.0042	-0.33	WD
WUNL4N		0.6827	-0.0075	-0.75	0.8213	-0.0075	-0.59	OE
WYJDCK		0.7000	0.0099	0.99	0.8333	0.0045	0.36	OE
WZP48T		0.6857	-0.0045	-0.45	0.8093	-0.0195	-1.53	GD
X79QBX		0.6943	0.0042	0.42	0.8483	0.0195	1.54	AE
XELL LJ		0.6703	-0.0198	-1.98	0.8117	-0.0171	-1.35	OE
XRAHYP		0.6923	0.0022	0.22	0.8320	0.0032	0.25	XX
Y7P7AK		0.7053	0.0152	1.52	0.8537	0.0249	1.96	OE
YQYZ6W	X	0.7000	0.0099	0.99	0.7897	-0.0391	-3.08	GD
YW38KZ		0.6800	-0.0101	-1.02	0.8100	-0.0188	-1.48	OE
ZD9LMF		0.6920	0.0019	0.19	0.8413	0.0125	0.99	IC
ZPXLEH		0.6883	-0.0018	-0.18	0.8200	-0.0088	-0.69	OE
ZRNQZP	*	0.6610	-0.0291	-2.92	0.7957	-0.0331	-2.61	OE
ZTV68V		0.6960	0.0059	0.59	0.8433	0.0145	1.14	IC
ZVM6AK		0.6883	-0.0018	-0.18	0.8340	0.0052	0.41	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.6901	Percent	0.8288	Percent
Std Dev Btwn Labs	0.0100	Percent	0.0127	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 122 of 128 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 171  
Chemical Analysis Element #2 - Carbon & Low Alloy Steel - Percent  
MANGANESE (Mn)

**Comments on assigned Data Flags for Analysis #171**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>DQQYAC</b>	X	Data for both samples are high.
<b>NTVAHV</b>	X	Data for sample L33 are high.
<b>PHWPT3</b>	X	Data for sample L33 are low.
<b>U9U6HH</b>	X	Data for sample L33 are high.
<b>V9NB83</b>	X	Data for both samples are low.
<b>YQYZ6W</b>	X	Data for sample L34 are low.

Cycle 113  
1st Q, 2016

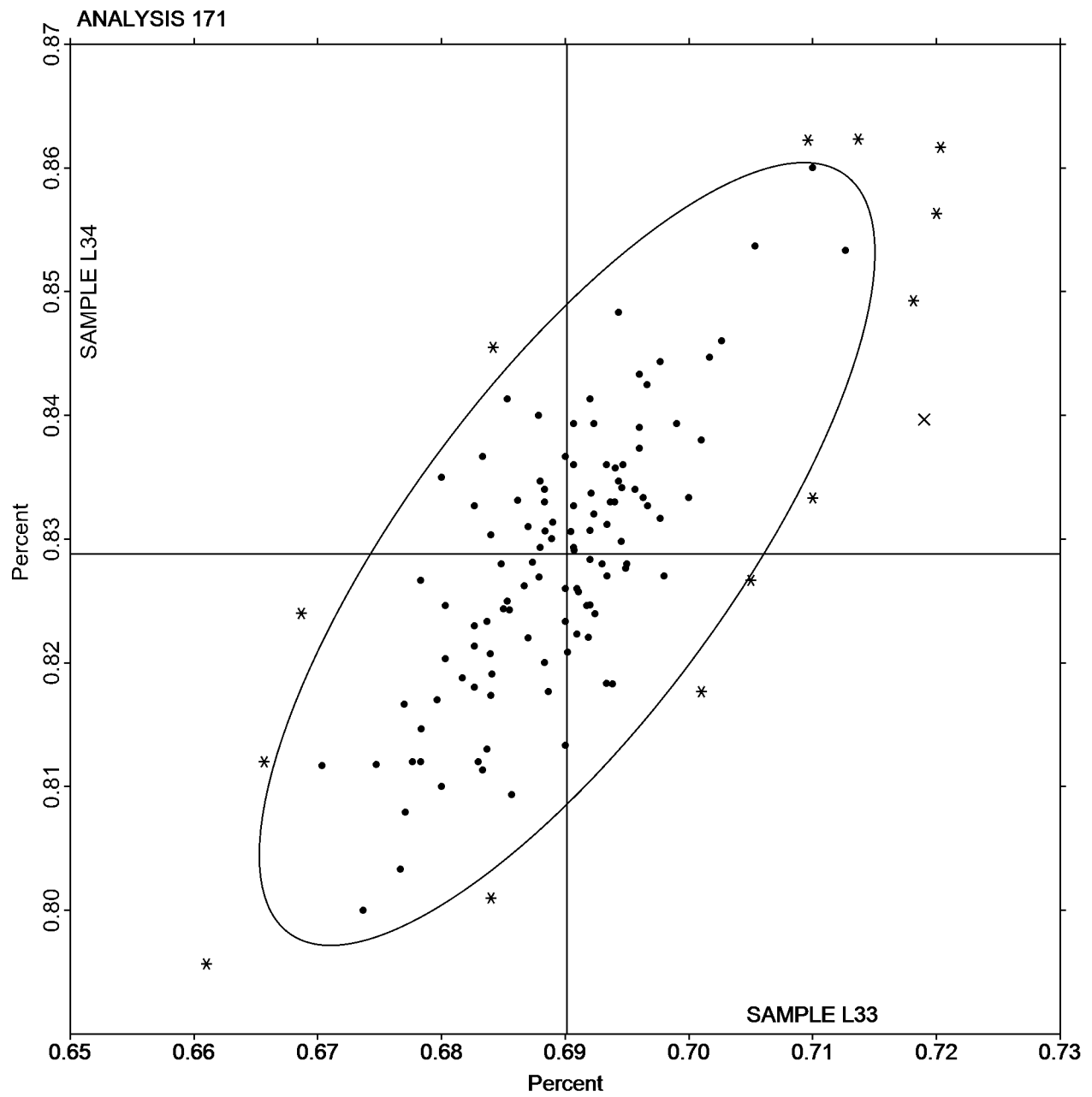
### Interlaboratory Testing Program for Metals

#### Analysis 171

Chemical Analysis Element #2 - Carbon & Low Alloy Steel - Percent  
MANGANESE (Mn)

SAMPLE L33  
0.6901 Percent

SAMPLE L34  
0.8288 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 172

Chemical Analysis Element #3 - Carbon & Low Alloy Steel - Percent  
PHOSPHORUS (P)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.0140	0.0000	0.02	0.00650	-0.00076	-0.78	IC
2BTRET		0.0135	-0.0005	-0.41	0.00680	-0.00046	-0.47	OE
2F36WR		0.0166	0.0026	2.31	0.00901	0.00176	1.82	OE
38PFVX		0.0146	0.0007	0.58	0.00750	0.00024	0.25	OE
3CZJGL		0.0121	-0.0019	-1.67	0.00590	-0.00136	-1.40	AE
3UZGXV		0.0120	-0.0020	-1.75	0.00683	-0.00042	-0.44	OE
4M289H		0.0121	-0.0019	-1.64	0.00673	-0.00052	-0.54	OE
4NAJNY		0.0134	-0.0005	-0.47	0.00670	-0.00056	-0.58	OE
4VQ34R	X	0.0168	0.0029	2.50	0.0137	0.00641	6.62	OE
4WMBFH		0.0145	0.0005	0.43	0.00783	0.00058	0.60	OE
4YTYJY		0.0143	0.0004	0.31	0.00797	0.00071	0.73	OE
66DAEE		0.0156	0.0016	1.39	0.00700	-0.00026	-0.27	IC
6GVUYB		0.0143	0.0003	0.25	0.00703	-0.00022	-0.23	OE
6V7LNP		0.0148	0.0008	0.69	0.00800	0.00074	0.77	OE
6XFP7R		0.0134	-0.0005	-0.47	0.00680	-0.00046	-0.47	OE
736KPB		0.0153	0.0014	1.19	0.00700	-0.00026	-0.27	OE
78VWHL		0.0141	0.0002	0.14	0.00680	-0.00046	-0.47	OE
7MA7CP		0.0118	-0.0022	-1.90	0.00507	-0.00219	-2.26	IC
87L8PP		0.0132	-0.0008	-0.71	0.00793	0.00068	0.70	OE
89PW44		0.0160	0.0020	1.77	0.00867	0.00141	1.46	GD
8ALF76		0.0151	0.0012	1.01	0.00791	0.00065	0.67	OE
8AWK8M		0.0137	-0.0003	-0.27	0.00700	-0.00026	-0.27	OE
8C7AZK		0.0152	0.0012	1.04	0.00747	0.00021	0.22	OE
8EUYVD		0.0123	-0.0016	-1.43	0.00673	-0.00052	-0.54	OE
8TW9YM		0.0132	-0.0008	-0.68	0.00673	-0.00052	-0.54	IC
8XPCNK	X	0.00833	-0.0056	-4.93	0.0160	0.00874	9.03	CL
8ZBDK6		0.0130	-0.0010	-0.85	0.00667	-0.00059	-0.61	OE
9C4UA7		0.0150	0.0010	0.91	0.00884	0.00158	1.63	OE
9U3DPF	*	0.0168	0.0029	2.50	0.00899	0.00173	1.79	AE
9YGUAQ		0.0138	-0.0001	-0.12	0.00713	-0.00012	-0.13	OE
9ZBF4H		0.0151	0.0011	0.98	0.00775	0.00049	0.51	OE
A3ADQF		0.0137	-0.0003	-0.27	0.00833	0.00108	1.11	OE
AAV8ZL	X	0.0147	0.0007	0.60	0.0103	0.00308	3.18	OE
AJH6UK		0.0136	-0.0004	-0.33	0.00653	-0.00072	-0.75	OE
ATMD7Q		0.0134	-0.0006	-0.50	0.00667	-0.00059	-0.61	OE
BQELJG		0.0140	0.0000	0.02	0.00700	-0.00026	-0.27	OE
BUDWFF		0.0160	0.0020	1.77	0.00800	0.00074	0.77	OE
C6A2FG		0.0142	0.0002	0.20	0.00700	-0.00026	-0.27	XX
CBE463		0.0150	0.0010	0.90	0.00800	0.00074	0.77	OE
CJRUGZ		0.0132	-0.0008	-0.66	0.00708	-0.00018	-0.18	OE
CPXKHZ		0.0140	0.0000	0.02	0.00707	-0.00019	-0.20	OE
CTW4E7		0.0138	-0.0002	-0.15	0.00720	-0.00006	-0.06	OE
DA2VMG		0.0115	-0.0025	-2.16	0.00847	0.00121	1.25	OE
DKLZXM		0.0146	0.0006	0.55	0.00623	-0.00102	-1.06	OE
DKXXXA		0.0156	0.0016	1.44	0.00907	0.00181	1.87	OE
DMRKN8		0.0140	0.0000	-0.01	0.00697	-0.00029	-0.30	OE
DQQYAC		0.0127	-0.0013	-1.14	0.00633	-0.00092	-0.95	OE
DTF2C4		0.0122	-0.0018	-1.55	0.00600	-0.00126	-1.30	IC
E3VH94		0.0140	0.0000	0.02	0.00770	0.00044	0.46	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 172

Chemical Analysis Element #3 - Carbon & Low Alloy Steel - Percent  
PHOSPHORUS (P)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
E6Z6QE		0.0137	-0.0002	-0.21	0.00623	-0.00102	-1.06	OE
EBPJMM		0.0138	-0.0001	-0.12	0.00693	-0.00032	-0.33	AE
EFYZVC		0.0129	-0.0011	-0.97	0.00893	0.00168	1.73	XX
EMLPH8		0.0148	0.0008	0.72	0.00733	0.00008	0.08	OE
EVBGTQ		0.0132	-0.0008	-0.68	0.00813	0.00088	0.91	OE
EYCJRF	*	0.0158	0.0018	1.59	0.0101	0.00281	2.90	OE
EZQT2F		0.0171	0.0031	2.73	0.00700	-0.00026	-0.27	OE
FVTQJ7		0.0157	0.0017	1.48	0.00933	0.00208	2.15	GD
G8KWQA		0.0133	-0.0006	-0.56	0.00800	0.00074	0.77	DR
GLJL7F	X	0.0180	0.0040	3.51	0.0180	0.01074	11.10	OE
GUU42Y		0.0141	0.0001	0.08	0.00683	-0.00042	-0.44	OE
HV2LZV		0.0141	0.0002	0.14	0.00740	0.00014	0.15	WD
JF4URY		0.0143	0.0004	0.31	0.00900	0.00174	1.80	OE
JKYNPZ		0.0160	0.0020	1.74	0.00630	-0.00096	-0.99	OE
JM67NV		0.0139	-0.0001	-0.11	0.00732	0.00006	0.06	OE
JR3M3B		0.0140	0.0000	0.02	0.00700	-0.00026	-0.27	OE
JTCTD7		0.0149	0.0010	0.84	0.00677	-0.00049	-0.51	OE
K4RZPZ		0.0119	-0.0021	-1.84	0.00657	-0.00069	-0.71	OE
KLQZYK		0.0147	0.0007	0.60	0.00697	-0.00029	-0.30	OE
KM7DDU		0.0154	0.0015	1.27	0.00827	0.00101	1.04	OE
KRXP6K		0.0156	0.0016	1.42	0.00840	0.00114	1.18	XX
KWRJ68		0.0125	-0.0014	-1.26	0.00527	-0.00199	-2.06	OE
LCGVJA		0.0127	-0.0013	-1.14	0.00767	0.00041	0.42	OE
LCW84Z		0.0120	-0.0020	-1.72	0.00713	-0.00012	-0.13	OE
M3RPUU		0.0143	0.0004	0.31	0.00763	0.00038	0.39	IC
MKN73X	X	0.0152	0.0012	1.07	0.0112	0.00391	4.04	OE
MUWJD2	X	0.0157	0.0017	1.48	0.0103	0.00308	3.18	OE
N4H4YX		0.0139	0.0000	-0.04	0.00750	0.00024	0.25	XX
NBWWAU		0.0151	0.0012	1.01	0.00760	0.00034	0.35	OE
NFQ4EN		0.0127	-0.0013	-1.11	0.00623	-0.00102	-1.06	OE
NMUXMX		0.0140	0.0000	0.02	0.00733	0.00008	0.08	OE
NTVAHV		0.0141	0.0001	0.11	0.00770	0.00044	0.46	OE
NVNX6W		0.0141	0.0001	0.08	0.00830	0.00104	1.08	WD
P69Q2Z		0.0142	0.0003	0.23	0.00673	-0.00052	-0.54	OE
PAH4JY		0.0158	0.0018	1.56	0.00855	0.00130	1.34	OE
PCLHFP		0.0134	-0.0005	-0.47	0.00660	-0.00066	-0.68	GD
PHRE2B		0.0127	-0.0013	-1.14	0.00600	-0.00126	-1.30	AE
PHWPT3	X	0.0210	0.0070	6.13	0.0130	0.00574	5.93	OE
PPD8DB		0.0133	-0.0006	-0.56	0.00700	-0.00026	-0.27	GD
PUMMMY		0.0127	-0.0012	-1.08	0.00740	0.00014	0.15	OE
Q4QWY6		0.0130	-0.0010	-0.85	0.00667	-0.00059	-0.61	DR
Q9ZFNB		0.0158	0.0018	1.61	0.00827	0.00102	1.05	OE
QHN98A		0.0130	-0.0010	-0.85	0.00600	-0.00126	-1.30	OE
QPCV3E		0.0139	-0.0001	-0.07	0.00630	-0.00096	-0.99	OE
QU6RR7		0.0154	0.0014	1.20	0.00695	-0.00030	-0.31	OE
RYR2E9		0.0129	-0.0011	-0.97	0.00640	-0.00086	-0.89	OE
T9WAU9		0.0138	-0.0001	-0.11	0.00696	-0.00030	-0.31	OE
TFBGX4		0.0138	-0.0001	-0.12	0.00757	0.00031	0.32	OE
U9U6HH		0.0137	-0.0003	-0.27	0.00700	-0.00026	-0.27	GD



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 172

Chemical Analysis Element #3 - Carbon & Low Alloy Steel - Percent  
PHOSPHORUS (P)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
U9VYDW		0.0132	-0.0007	-0.65	0.00603	-0.00122	-1.26	OE
UAQGEX		0.0123	-0.0016	-1.43	0.00600	-0.00126	-1.30	AE
UY3PNY		0.0156	0.0017	1.45	0.00863	0.00138	1.42	OE
UZDQHX		0.0137	-0.0003	-0.27	0.00693	-0.00032	-0.33	OE
V9NB83	X	0.0170	0.0030	2.64	0.0107	0.00344	3.56	OE
VAKJJT		0.0139	0.0000	-0.04	0.00643	-0.00082	-0.85	OE
VBF3LU		0.0128	-0.0011	-1.00	0.00663	-0.00062	-0.64	OE
VF7JVY		0.0136	-0.0004	-0.36	0.00684	-0.00042	-0.43	OE
VLYJDZ		0.0120	-0.0020	-1.72	0.00600	-0.00126	-1.30	OE
VPBQBY		0.0126	-0.0014	-1.20	0.00700	-0.00026	-0.27	OE
VYXN7J		0.0161	0.0021	1.83	0.00967	0.00241	2.49	OE
VZVYDU		0.0130	-0.0010	-0.85	0.00767	0.00041	0.42	OE
WAVPJM		0.0149	0.0009	0.81	0.00777	0.00052	0.53	OE
WLA3B3		0.0133	-0.0006	-0.56	0.00633	-0.00092	-0.95	OE
WUNL4N		0.0147	0.0007	0.60	0.00743	0.00018	0.18	OE
WYJDCK		0.0140	0.0000	0.02	0.00700	-0.00026	-0.27	OE
WZP48T		0.0140	0.0000	0.02	0.00733	0.00008	0.08	GD
X79QBX		0.0143	0.0004	0.31	0.00700	-0.00026	-0.27	AE
XELLLJ		0.0130	-0.0010	-0.88	0.00683	-0.00042	-0.44	OE
XRAHYP		0.0122	-0.0018	-1.55	0.00667	-0.00059	-0.61	XX
Y7P7AK		0.0146	0.0006	0.55	0.00870	0.00144	1.49	OE
YQYZ6W		0.0153	0.0014	1.19	0.00900	0.00174	1.80	GD
YW38KZ		0.0150	0.0010	0.90	0.00933	0.00208	2.15	OE
ZD9LMF	X	0.0180	0.0040	3.51	0.0107	0.00341	3.52	IC
ZPXLEH		0.0146	0.0007	0.58	0.00717	-0.00009	-0.09	OE
ZRNQZP	*	0.0137	-0.0003	-0.24	0.00520	-0.00206	-2.13	OE
ZTV68V		0.0120	-0.0020	-1.72	0.00500	-0.00226	-2.33	IC
ZVM6AK		0.0156	0.0017	1.45	0.00760	0.00034	0.35	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.0140	Percent	0.00726	Percent
Std Dev Btwn Labs	0.0011	Percent	0.00097	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 113 of 126 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 172  
Chemical Analysis Element #3 - Carbon & Low Alloy Steel - Percent  
PHOSPHORUS (P)

**Comments on assigned Data Flags for Analysis #172**

WebCode   Flag   Analyst Comment

**4VQ34R**   X   Data for sample L34 are high.

**8XPCNK**   X   Data for sample L33 are low and data for sample L34 are high. Inconsistent within the determinations of sample L34.

**AAV8ZL**   X   Data for sample L34 are high.

**GLJL7F**   X   Data for both samples are high. Inconsistent within the determinations of both samples.

**MKN73X**   X   Data for sample L34 are high.

**MUWJD2**   X   Data for sample L34 are high.

**PHWPT3**   X   Data for both samples are high.

**V9NB83**   X   Data for sample L34 are high. Inconsistent within the determinations of sample L34.

**ZD9LMF**   X   Data for both samples are high. Inconsistent within the determinations of sample L33.

Cycle 113  
1st Q, 2016

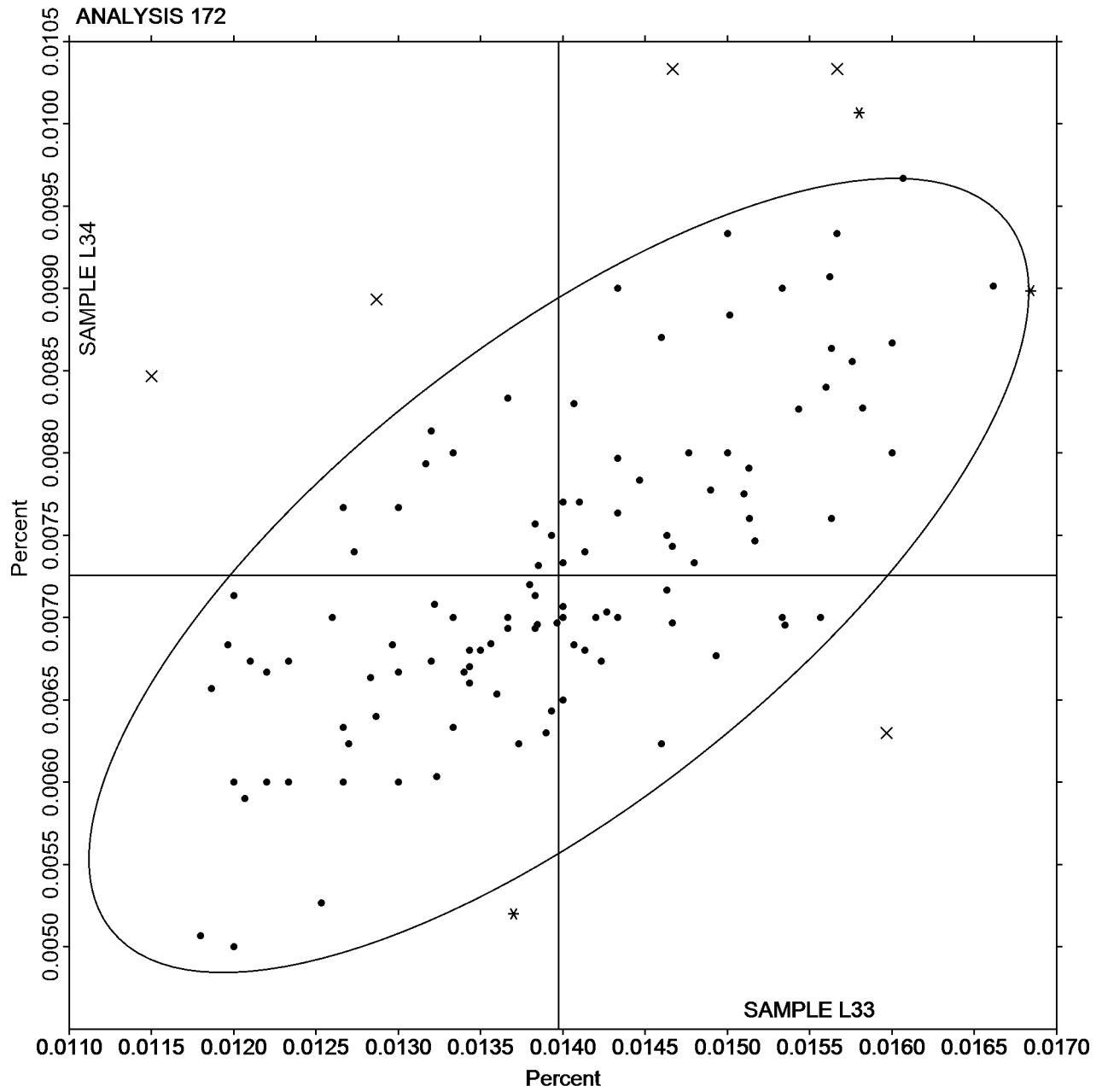
### Interlaboratory Testing Program for Metals

### Analysis 172

Chemical Analysis Element #3 - Carbon & Low Alloy Steel - Percent  
PHOSPHORUS (P)

SAMPLE L33  
0.0140 Percent

SAMPLE L34  
0.00726 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 173

Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.0114	-0.0009	-0.77	0.00117	-0.00060	-0.72	CI
2BTRET		0.0110	-0.0013	-1.10	0.00165	-0.00011	-0.14	CO
2F36WR	X	0.0184	0.0060	4.98	0.0102	0.00846	10.20	OE
38PFVX		0.0118	-0.0005	-0.44	0.00087	-0.00090	-1.08	CI
3CZJGL		0.0117	-0.0006	-0.53	0.00127	-0.00050	-0.60	AE
3UZGXV		0.0127	0.0003	0.27	0.00257	0.00080	0.96	OE
4M289H		0.0124	0.0001	0.05	0.00112	-0.00065	-0.78	OE
4NAJNY		0.0115	-0.0008	-0.69	0.00103	-0.00073	-0.88	OE
4VQ34R	X	0.0180	0.0057	4.68	0.0103	0.00857	10.33	OE
4WMBFH		0.0133	0.0010	0.83	0.00310	0.00133	1.61	OE
4YTYJY		0.0127	0.0003	0.27	0.00233	0.00057	0.68	OE
66DAEE		0.0119	-0.0005	-0.39	0.00157	-0.00020	-0.24	GD
6GVUYB	*	0.0152	0.0029	2.37	0.00090	-0.00087	-1.04	OE
6V7LNP		0.0122	-0.0001	-0.11	0.00173	-0.00003	-0.04	OE
6XFP7R		0.0119	-0.0005	-0.39	0.00093	-0.00083	-1.00	CI
78VWHL		0.0112	-0.0011	-0.91	0.00107	-0.00070	-0.84	OE
7MA7CP		0.0120	-0.0003	-0.28	0.00087	-0.00090	-1.08	CI
87L8PP	M	0.00917	-0.0032	-2.62	No Data Reported			OE
89PW44		0.0130	0.0007	0.55	0.00133	-0.00043	-0.52	GD
8ALF76		0.0112	-0.0011	-0.94	0.00127	-0.00049	-0.59	OE
8AWK8M		0.0147	0.0023	1.93	0.00300	0.00123	1.49	OE
8C7AZK		0.0147	0.0024	1.98	0.00187	0.00010	0.12	OE
8EUYVD		0.0123	0.0000	0.00	0.00300	0.00123	1.49	OE
8TW9YM		0.0105	-0.0018	-1.52	0.00093	-0.00083	-1.00	CI
8XPCNK		0.0115	-0.0009	-0.72	0.00127	-0.00050	-0.60	CI
8ZBDK6		0.0130	0.0007	0.55	0.00200	0.00023	0.28	OE
9C4UA7		0.0124	0.0001	0.07	0.00335	0.00159	1.91	OE
9U3DPF		0.0137	0.0013	1.10	0.00139	-0.00038	-0.46	AE
9YGUAQ		0.0130	0.0007	0.58	0.00203	0.00027	0.32	OE
9ZBF4H		0.0117	-0.0007	-0.55	0.00120	-0.00057	-0.68	CI
A3ADQF		0.0120	-0.0003	-0.28	0.00100	-0.00077	-0.92	OE
AAV8ZL	*	0.0120	-0.0003	-0.28	0.00400	0.00223	2.69	OE
AJH6UK		0.0109	-0.0015	-1.21	0.00117	-0.00060	-0.72	CI
ATMD7Q		0.0116	-0.0007	-0.58	0.00137	-0.00040	-0.48	OE
BQELJG		0.0120	-0.0003	-0.28	0.00200	0.00023	0.28	OE
BUDWFF		0.0116	-0.0007	-0.61	0.00150	-0.00027	-0.32	CO
C6A2FG		0.0132	0.0008	0.69	0.00160	-0.00017	-0.20	OE
CBE463		0.0117	-0.0007	-0.55	0.00200	0.00023	0.28	CO
CJRUGZ	*	0.0153	0.0029	2.43	0.00354	0.00177	2.13	OE
CPXKHZ		0.0118	-0.0006	-0.47	0.00190	0.00013	0.16	OE
CTW4E7		0.0127	0.0003	0.27	0.00130	-0.00047	-0.56	OE
DA2VMG	*	0.0132	0.0008	0.69	0.00387	0.00210	2.53	OE
DKLZXM		0.0118	-0.0005	-0.42	0.00130	-0.00047	-0.56	OE
DKXXXA		0.0139	0.0015	1.26	0.00323	0.00146	1.76	OE
DMRKN8		0.0125	0.0002	0.16	0.00137	-0.00040	-0.48	OE
DQQYAC	M	0.00967	-0.0027	-2.21	No Data Reported			OE
DTF2C4	X	0.0179	0.0055	4.57	0.00040	-0.00137	-1.65	CO
E3VH94		0.00950	-0.0028	-2.34	0.00090	-0.00087	-1.04	OE
E6Z6QE		0.0130	0.0007	0.55	0.00217	0.00040	0.48	OE

Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 173

Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EBPJMM		0.0119	-0.0004	-0.34	0.00099	-0.00078	-0.94	CI
EFYZVC	X	0.0116	-0.0007	-0.61	0.00567	0.00390	4.70	XX
EMLPH8		0.0130	0.0006	0.52	0.00150	-0.00027	-0.32	OE
EVBGTQ		0.0124	0.0000	0.03	0.00297	0.00120	1.45	OE
EYCJRF		0.0139	0.0016	1.32	0.00247	0.00070	0.84	OE
EZQT2F		0.0117	-0.0007	-0.55	0.00133	-0.00043	-0.52	OE
FVTQJ7		0.0137	0.0013	1.10	0.00100	-0.00077	-0.92	GD
G8KWQA	X	0.0133	0.0010	0.83	0.00800	0.00623	7.51	CI
GLJL7F	X	0.0143	0.0020	1.65	0.0107	0.00890	10.73	OE
GUU42Y		0.0125	0.0001	0.11	0.00127	-0.00050	-0.60	CO
HV2LZV		0.0121	-0.0002	-0.19	0.00143	-0.00033	-0.40	CI
JF4URY		0.0143	0.0020	1.65	0.00200	0.00023	0.28	OE
JKYNPZ		0.0124	0.0000	0.03	0.00113	-0.00063	-0.76	OE
JM67NV		0.0121	-0.0002	-0.19	0.00260	0.00083	1.00	OE
JR3M3B		0.0130	0.0007	0.55	0.00200	0.00023	0.28	OE
JTCTD7		0.0110	-0.0013	-1.10	0.00078	-0.00098	-1.18	OE
K4RZPZ		0.0125	0.0001	0.11	0.00293	0.00117	1.41	OE
KLQZYK		0.0120	-0.0003	-0.28	0.00130	-0.00047	-0.56	OE
KM7DDU	X	0.0146	0.0023	1.90	0.00713	0.00537	6.47	OE
KRXP6K	*	0.0140	0.0017	1.38	0.00400	0.00223	2.69	XX
KWRJ68	M	0.00883	-0.0035	-2.90	No Data Reported			OE
LCGVJA		0.0123	0.0000	0.00	0.00307	0.00130	1.57	OE
LCW84Z		0.0128	0.0004	0.36	0.00117	-0.00060	-0.72	CI
M3RPUU		0.0125	0.0001	0.11	0.00100	-0.00077	-0.92	CI
MKN73X		0.0142	0.0019	1.57	0.00183	0.00007	0.08	OE
MUWJD2	X	0.0137	0.0013	1.10	0.00510	0.00333	4.02	OE
N4H4YX		0.0112	-0.0012	-0.97	0.00110	-0.00067	-0.80	OE
NBWWAU		0.0123	-0.0001	-0.06	0.00110	-0.00067	-0.80	OE
NFQ4EN		0.0116	-0.0008	-0.64	0.00093	-0.00083	-1.00	OE
NMUXMX		0.0140	0.0017	1.38	0.00100	-0.00077	-0.92	OE
NTVAHV		0.0115	-0.0009	-0.72	0.00123	-0.00053	-0.64	OE
NVNX6W	M	0.0122	-0.0001	-0.08	No Data Reported			CI
P69Q2Z		0.00983	-0.0025	-2.07	0.00187	0.00010	0.12	OE
PAH4JY	*	0.0152	0.0029	2.39	0.00092	-0.00085	-1.02	OE
PCLHFP		0.0122	-0.0001	-0.11	0.00180	0.00003	0.04	GD
PHRE2B		0.0127	0.0003	0.27	0.00233	0.00057	0.68	AE
PHWPT3	*	0.0140	0.0017	1.38	0.00030	-0.00147	-1.77	CO
PPD8DB		0.0113	-0.0010	-0.83	0.00300	0.00123	1.49	GD
PUMMMY		0.0116	-0.0008	-0.64	0.00080	-0.00097	-1.16	OE
Q4QWY6		0.0133	0.0010	0.83	0.00267	0.00090	1.09	DR
Q9ZFNB		0.0119	-0.0004	-0.33	0.00255	0.00078	0.94	OE
QHN98A		0.0120	-0.0003	-0.28	0.00133	-0.00043	-0.52	OE
QPCV3E		0.0127	0.0004	0.30	0.00220	0.00043	0.52	OE
QU6RR7		0.0147	0.0023	1.91	0.00217	0.00040	0.49	OE
RYR2E9		0.0117	-0.0006	-0.50	0.00137	-0.00040	-0.48	OE
T9WAU9		0.0129	0.0006	0.47	0.00205	0.00028	0.34	OE
TFBGX4		0.0132	0.0009	0.74	0.00190	0.00013	0.16	OE
U9U6HH		0.0113	-0.0010	-0.83	0.00100	-0.00077	-0.92	GD
U9VYDW		0.0128	0.0005	0.41	0.00237	0.00060	0.72	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 173

Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UAQGEX		0.0127	0.0003	0.27	0.00200	0.00023	0.28	AE
UY3PNY		0.0118	-0.0005	-0.44	0.00127	-0.00050	-0.60	OE
UZDQHX		0.0113	-0.0010	-0.83	0.00260	0.00083	1.01	OE
V9NB83		0.0118	-0.0005	-0.44	0.00117	-0.00060	-0.72	OE
VAKJJT		0.00967	-0.0027	-2.21	0.00163	-0.00013	-0.16	OE
VBF3LU		0.0130	0.0007	0.55	0.00303	0.00127	1.53	CI
VF7JVY		0.0111	-0.0012	-1.02	0.00107	-0.00069	-0.84	OE
VLYJDZ		0.0110	-0.0013	-1.10	0.00200	0.00023	0.28	OE
VPBQBY		0.0121	-0.0002	-0.19	0.00260	0.00083	1.01	OE
VYXN7J		0.0135	0.0012	0.99	0.00363	0.00187	2.25	OE
VZVYDU	X	0.0147	0.0023	1.93	0.00830	0.00653	7.88	OE
WAVPJM		0.0123	0.0000	0.00	0.00100	-0.00077	-0.92	CI
WLA3B3		0.0130	0.0007	0.55	0.00100	-0.00077	-0.92	OE
WUNL4N		0.0132	0.0009	0.74	0.00190	0.00013	0.16	OE
WYJDCK		0.0133	0.0010	0.83	0.00200	0.00023	0.28	OE
WZP48T		0.0103	-0.0020	-1.66	0.00033	-0.00143	-1.73	GD
X79QBX	M	0.00767	-0.0047	-3.86	No Data Reported			AE
XELLLJ		0.0111	-0.0012	-1.02	0.00182	0.00005	0.06	OE
XRAHYP		0.0110	-0.0013	-1.10	0.00190	0.00013	0.16	XX
Y7P7AK		0.0153	0.0030	2.48	0.00263	0.00087	1.05	OE
YQYZ6W		0.0110	-0.0013	-1.10	0.00033	-0.00143	-1.73	GD
YW38KZ	X	0.0123	0.0000	0.00	0.00433	0.00257	3.09	OE
ZD9LMF		0.0110	-0.0013	-1.10	0.00200	0.00023	0.28	CI
ZPXLEH	X	0.0166	0.0042	3.50	0.00187	0.00010	0.12	OE
ZRNQZP		0.00947	-0.0029	-2.37	0.00120	-0.00057	-0.68	OE
ZTV68V		0.0120	-0.0003	-0.28	0.00120	-0.00057	-0.68	OE
ZVM6AK		0.0123	-0.0001	-0.06	0.00243	0.00067	0.80	CI

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.0123	Percent	0.00177	Percent
Std Dev Btwn Labs	0.0012	Percent	0.00083	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 109 of 125 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 173  
Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

**Comments on assigned Data Flags for Analysis #173**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
2F36WR	X	Data for both samples are high.
4VQ34R	X	Data for both samples are high.
87L8PP	M	Laboratory did not submit data for sample L34.
DQQYAC	M	Laboratory did not submit data for sample L34.
DTF2C4	X	Data for sample L33 are high. Inconsistent within the determinations of sample L33.
EFYZVC	X	Data for sample L34 are high.
G8KWQA	X	Data for sample L34 are high.
GLJL7F	X	Data for sample L34 are high. Inconsistent within the determinations of sample L34.
KM7DDU	X	Data for sample L34 are high.
KWRJ68	M	Laboratory did not submit data for sample L34.
MUWJD2	X	Data for sample L34 are high.
NVNX6W	M	Laboratory did not submit data for sample L34.
VZVYDU	X	Data for sample L34 are high.
X79QBX	M	Laboratory did not submit data for sample L34.
YW38KZ	X	Data for sample L34 are high. Inconsistent within the determinations of sample L34.

Cycle 113  
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Interlaboratory Testing Program for Metals

Analysis 173

Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

ZPXLEH X Data for sample L33 are high.



Cycle 113  
1st Q, 2016

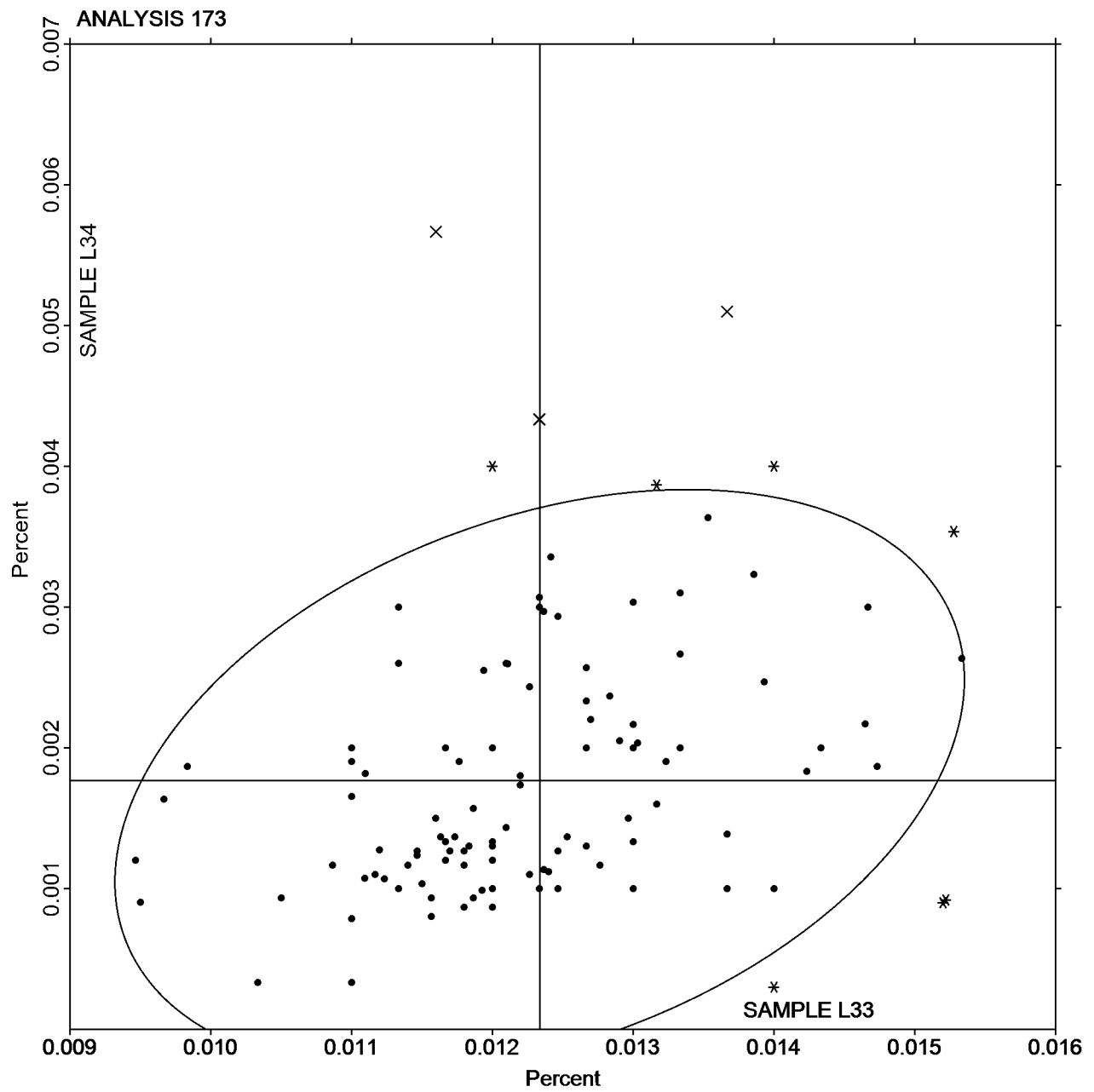
### Interlaboratory Testing Program for Metals

### Analysis 173

Chemical Analysis Element #4 - Carbon & Low Alloy Steel - Percent  
SULFUR (S)

SAMPLE L33  
0.0123 Percent

SAMPLE L34  
0.00177 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 174

Chemical Analysis Element #5 - Carbon & Low Alloy Steel - Percent  
SILICON (Si)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.2627	0.0002	0.05	0.2833	0.0006	0.11	GR
2BTRET		0.2580	-0.0045	-0.96	0.2709	-0.0118	-1.94	OE
2F36WR	X	0.2806	0.0181	3.91	0.3101	0.0274	4.52	OE
38PFVX		0.2643	0.0019	0.41	0.2807	-0.0020	-0.33	OE
3CZJGL		0.2613	-0.0011	-0.23	0.2820	-0.0007	-0.11	AE
3UZGXV		0.2601	-0.0024	-0.51	0.2781	-0.0046	-0.75	OE
4M289H		0.2582	-0.0043	-0.92	0.2774	-0.0053	-0.88	OE
4NAJNY		0.2590	-0.0034	-0.74	0.2817	-0.0010	-0.17	OE
4VQ34R		0.2570	-0.0054	-1.17	0.2843	0.0016	0.26	OE
4WMBFH		0.2670	0.0045	0.98	0.2914	0.0087	1.44	OE
4YTYJY		0.2587	-0.0038	-0.81	0.2820	-0.0007	-0.11	OE
66DAEE		0.2603	-0.0021	-0.45	0.2833	0.0006	0.11	GD
6GVUYB		0.2667	0.0042	0.91	0.2833	0.0006	0.11	OE
6V7LNP		0.2630	0.0006	0.12	0.2840	0.0013	0.22	OE
6XFP7R		0.2600	-0.0024	-0.52	0.2837	0.0010	0.16	OE
736KPB		0.2600	-0.0024	-0.52	0.2733	-0.0094	-1.54	OE
78VWHL		0.2580	-0.0044	-0.95	0.2730	-0.0097	-1.59	OE
7MA7CP		0.2636	0.0011	0.25	0.2838	0.0011	0.18	IC
87L8PP		0.2580	-0.0044	-0.95	0.2740	-0.0087	-1.43	OE
89PW44	X	0.2560	-0.0064	-1.38	0.1993	-0.0834	-13.76	GD
8ALF76		0.2635	0.0010	0.23	0.2753	-0.0074	-1.23	OE
8AWK8M		0.2670	0.0046	0.99	0.2927	0.0100	1.65	OE
8C7AZK		0.2567	-0.0058	-1.24	0.2780	-0.0047	-0.77	OE
8EUYVD		0.2579	-0.0045	-0.97	0.2780	-0.0047	-0.77	OE
8TW9YM		0.2670	0.0046	0.99	0.2880	0.0053	0.88	XX
8XPCNK	X	0.2803	0.0179	3.86	0.3020	0.0193	3.19	GR
8ZBDK6		0.2667	0.0042	0.91	0.2900	0.0073	1.21	OE
9C4UA7		0.2589	-0.0035	-0.76	0.2798	-0.0029	-0.48	OE
9U3DPF		0.2659	0.0035	0.75	0.2849	0.0022	0.37	AE
9YGUAQ		0.2647	0.0022	0.48	0.2831	0.0004	0.06	OE
9ZBF4H	*	0.2633	0.0009	0.20	0.2727	-0.0100	-1.65	OE
A3ADQF		0.2630	0.0006	0.12	0.2747	-0.0080	-1.32	OE
AAV8ZL	*	0.2740	0.0116	2.49	0.2963	0.0136	2.25	OE
AJH6UK		0.2624	0.0000	0.00	0.2782	-0.0045	-0.74	OE
ATMD7Q		0.2577	-0.0048	-1.02	0.2817	-0.0010	-0.17	OE
BQELJG		0.2637	0.0012	0.27	0.2877	0.0050	0.82	OE
BUDWFF		0.2670	0.0046	0.99	0.2897	0.0070	1.15	OE
C6A2FG		0.2600	-0.0024	-0.51	0.2793	-0.0034	-0.57	OE
CBE463		0.2610	-0.0014	-0.31	0.2817	-0.0010	-0.17	OE
CJRUZG	X	0.2843	0.0219	4.72	0.3128	0.0301	4.97	OE
CPXKHZ		0.2620	-0.0004	-0.09	0.2817	-0.0010	-0.17	OE
CTW4E7		0.2628	0.0004	0.08	0.2818	-0.0009	-0.15	OE
DA2VMG		0.2670	0.0046	0.99	0.2903	0.0076	1.26	OE
DKLZXM		0.2607	-0.0018	-0.38	0.2860	0.0033	0.55	OE
DKXXXA		0.2588	-0.0036	-0.78	0.2741	-0.0086	-1.42	OE
DMRKN8		0.2579	-0.0045	-0.97	0.2750	-0.0077	-1.28	OE
DQQYAC		0.2617	-0.0008	-0.16	0.2843	0.0016	0.27	OE
DTF2C4		0.2507	-0.0118	-2.53	0.2793	-0.0034	-0.55	IC
E3VH94		0.2617	-0.0008	-0.16	0.2820	-0.0007	-0.11	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 174

Chemical Analysis Element #5 - Carbon & Low Alloy Steel - Percent  
SILICON (Si)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
E6Z6QE		0.2637	0.0012	0.27	0.2820	-0.0007	-0.11	OE
EBPJMM		0.2633	0.0009	0.20	0.2897	0.0070	1.15	AE
EFYZVC		0.2593	-0.0031	-0.67	0.2797	-0.0030	-0.50	XX
EMLPH8		0.2621	-0.0004	-0.08	0.2761	-0.0066	-1.09	OE
EVBGTQ		0.2597	-0.0027	-0.59	0.2847	0.0020	0.33	OE
EYCJRF		0.2670	0.0046	0.99	0.2903	0.0076	1.26	OE
EZQT2F	X	0.2377	-0.0248	-5.33	0.2577	-0.0250	-4.13	OE
FVTQJ7		0.2520	-0.0104	-2.24	0.2867	0.0040	0.66	GD
G8KWQA		0.2670	0.0046	0.99	0.2877	0.0050	0.82	DR
GLJL7F		0.2670	0.0046	0.99	0.2897	0.0070	1.15	OE
GUU42Y		0.2550	-0.0074	-1.60	0.2800	-0.0027	-0.44	OE
HV2LZV		0.2617	-0.0008	-0.16	0.2830	0.0003	0.05	WD
HVLGBK		0.2667	0.0042	0.91	0.2786	-0.0041	-0.68	OE
JF4URY		0.2657	0.0032	0.70	0.2857	0.0030	0.49	OE
JKYNPZ		0.2650	0.0026	0.55	0.2823	-0.0004	-0.06	OE
JM67NV		0.2679	0.0055	1.19	0.2838	0.0011	0.19	OE
JR3M3B		0.2660	0.0036	0.77	0.2843	0.0016	0.27	OE
JTCTD7		0.2643	0.0019	0.41	0.2843	0.0016	0.27	OE
K4RZPZ		0.2617	-0.0008	-0.16	0.2801	-0.0026	-0.43	OE
KLQZYK		0.2587	-0.0038	-0.81	0.2810	-0.0017	-0.28	OE
KM7DDU		0.2673	0.0049	1.06	0.2910	0.0083	1.37	OE
KRXP6K		0.2630	0.0006	0.12	0.2810	-0.0017	-0.28	XX
KWRJ68		0.2571	-0.0053	-1.14	0.2771	-0.0056	-0.92	OE
LCGVJA		0.2588	-0.0036	-0.78	0.2769	-0.0058	-0.96	OE
LCW84Z		0.2573	-0.0051	-1.10	0.2800	-0.0027	-0.44	OE
M3RPUU		0.2577	-0.0048	-1.02	0.2807	-0.0020	-0.33	IC
MKN73X	X	0.2970	0.0346	7.45	0.3147	0.0320	5.28	OE
MUWJD2	X	0.2347	-0.0278	-5.98	0.2630	-0.0197	-3.25	OE
N4H4YX		0.2667	0.0043	0.92	0.2939	0.0112	1.85	OE
NBWWAU		0.2625	0.0001	0.02	0.2888	0.0061	1.01	OE
NFQ4EN		0.2558	-0.0066	-1.42	0.2719	-0.0108	-1.78	OE
NMUXMX		0.2693	0.0069	1.49	0.2917	0.0090	1.48	OE
NTVAHV	X	0.2383	-0.0241	-5.19	0.2593	-0.0234	-3.86	OE
NVNX6W		0.2533	-0.0091	-1.96	0.2730	-0.0097	-1.60	WD
P69Q2Z		0.2733	0.0109	2.35	0.2930	0.0103	1.70	OE
PAH4JY		0.2621	-0.0004	-0.08	0.2821	-0.0006	-0.10	OE
PHRE2B		0.2643	0.0019	0.41	0.2810	-0.0017	-0.28	AE
PHWPT3	X	0.2820	0.0196	4.22	0.3050	0.0223	3.68	OE
PPD8DB	X	0.2520	-0.0104	-2.24	0.2837	0.0010	0.16	GD
PUMMMY		0.2598	-0.0027	-0.57	0.2847	0.0020	0.33	OE
Q4QWY6		0.2580	-0.0044	-0.95	0.2813	-0.0014	-0.22	DR
Q9ZFNB	*	0.2576	-0.0048	-1.04	0.2867	0.0040	0.66	OE
QHN98A		0.2673	0.0049	1.06	0.2857	0.0030	0.49	OE
QPCV3E		0.2604	-0.0020	-0.44	0.2777	-0.0050	-0.82	OE
QU6RR7	*	0.2756	0.0132	2.83	0.2948	0.0121	2.00	OE
RYR2E9		0.2593	-0.0031	-0.67	0.2807	-0.0020	-0.33	OE
T9WAU9		0.2593	-0.0031	-0.67	0.2751	-0.0076	-1.25	OE
TFBGX4		0.2642	0.0018	0.38	0.2794	-0.0033	-0.54	OE
U9U6HH		0.2700	0.0076	1.63	0.2900	0.0073	1.21	GD

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 174

Chemical Analysis Element #5 - Carbon & Low Alloy Steel - Percent  
SILICON (Si)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
U9VYDW		0.2639	0.0015	0.32	0.2823	-0.0004	-0.06	OE
UAQGEX		0.2650	0.0026	0.55	0.2810	-0.0017	-0.28	AE
UY3PNY		0.2690	0.0066	1.42	0.2893	0.0066	1.10	OE
UZDQHX		0.2527	-0.0098	-2.10	0.2740	-0.0087	-1.43	OE
V9NB83		0.2611	-0.0014	-0.29	0.2827	0.0000	0.00	OE
VAKJJT		0.2707	0.0082	1.78	0.2940	0.0113	1.87	OE
VBF3LU		0.2590	-0.0034	-0.73	0.2780	-0.0047	-0.77	OE
VF7JVY		0.2547	-0.0077	-1.65	0.2703	-0.0124	-2.05	OE
VLYJDZ		0.2633	0.0009	0.20	0.2917	0.0090	1.48	OE
VPBQBY		0.2600	-0.0024	-0.52	0.2810	-0.0017	-0.28	OE
VYXN7J		0.2720	0.0096	2.06	0.2977	0.0150	2.47	OE
VZVYDU		0.2580	-0.0044	-0.95	0.2837	0.0010	0.16	OE
WAVPJM		0.2657	0.0032	0.70	0.2817	-0.0010	-0.17	OE
WLA3B3		0.2617	-0.0008	-0.16	0.2800	-0.0027	-0.44	OE
WRH6P6		0.2589	-0.0036	-0.77	0.2806	-0.0021	-0.34	WD
WUNL4N		0.2583	-0.0041	-0.88	0.2773	-0.0054	-0.88	OE
WYJDCK	X	0.2767	0.0142	3.07	0.2900	0.0073	1.21	OE
WZP48T		0.2573	-0.0051	-1.10	0.2783	-0.0044	-0.72	GD
X79QBX		0.2573	-0.0051	-1.10	0.2753	-0.0074	-1.21	AE
XELLJ		0.2640	0.0016	0.34	0.2903	0.0076	1.26	OE
XRAHYP		0.2550	-0.0074	-1.60	0.2750	-0.0077	-1.27	XX
Y7P7AK	*	0.2760	0.0136	2.92	0.2950	0.0123	2.03	OE
YQYZ6W		0.2660	0.0036	0.77	0.2910	0.0083	1.37	GD
YW38KZ		0.2657	0.0032	0.70	0.2840	0.0013	0.22	OE
ZD9LMF	X	0.2820	0.0196	4.22	0.3027	0.0200	3.30	IC
ZPXLEH		0.2620	-0.0004	-0.09	0.2830	0.0003	0.05	OE
ZRNQZP		0.2557	-0.0068	-1.45	0.2760	-0.0067	-1.10	OE
ZTV68V		0.2633	0.0009	0.20	0.2827	0.0000	0.00	IC
ZVM6AK		0.2670	0.0046	0.99	0.2903	0.0076	1.26	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.2624	Percent	0.2827	Percent
Std Dev Btwn Labs	0.0046	Percent	0.0061	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 113 of 127 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 174  
Chemical Analysis Element #5 - Carbon & Low Alloy Steel - Percent  
SILICON (Si)

**Comments on assigned Data Flags for Analysis #174**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>2F36WR</b>	X	Data for both samples are high.
<b>89PW44</b>	X	Data for sample L34 are low.
<b>8XPCNK</b>	X	Data for both samples are high.
<b>CJRUZG</b>	X	Data for both samples are high. Inconsistent within the determinations of sample L34.
<b>EZQT2F</b>	X	Data for both samples are low.
<b>MKN73X</b>	X	Data for both samples are high. Inconsistent within the determinations of both samples.
<b>MUWJD2</b>	X	Data for both samples are low. Inconsistent within the determinations of sample L33.
<b>NTVAHV</b>	X	Data for both samples are low.
<b>PHWPT3</b>	X	Data for both samples are high.
<b>PPD8DB</b>	X	Inconsistent in testing between samples. Inconsistent within the determinations of sample L34.
<b>WYJDCK</b>	X	Data for sample L33 are high. Inconsistent within the determinations of sample L33.
<b>ZD9LMF</b>	X	Data for both samples are high.

Cycle 113  
1st Q, 2016

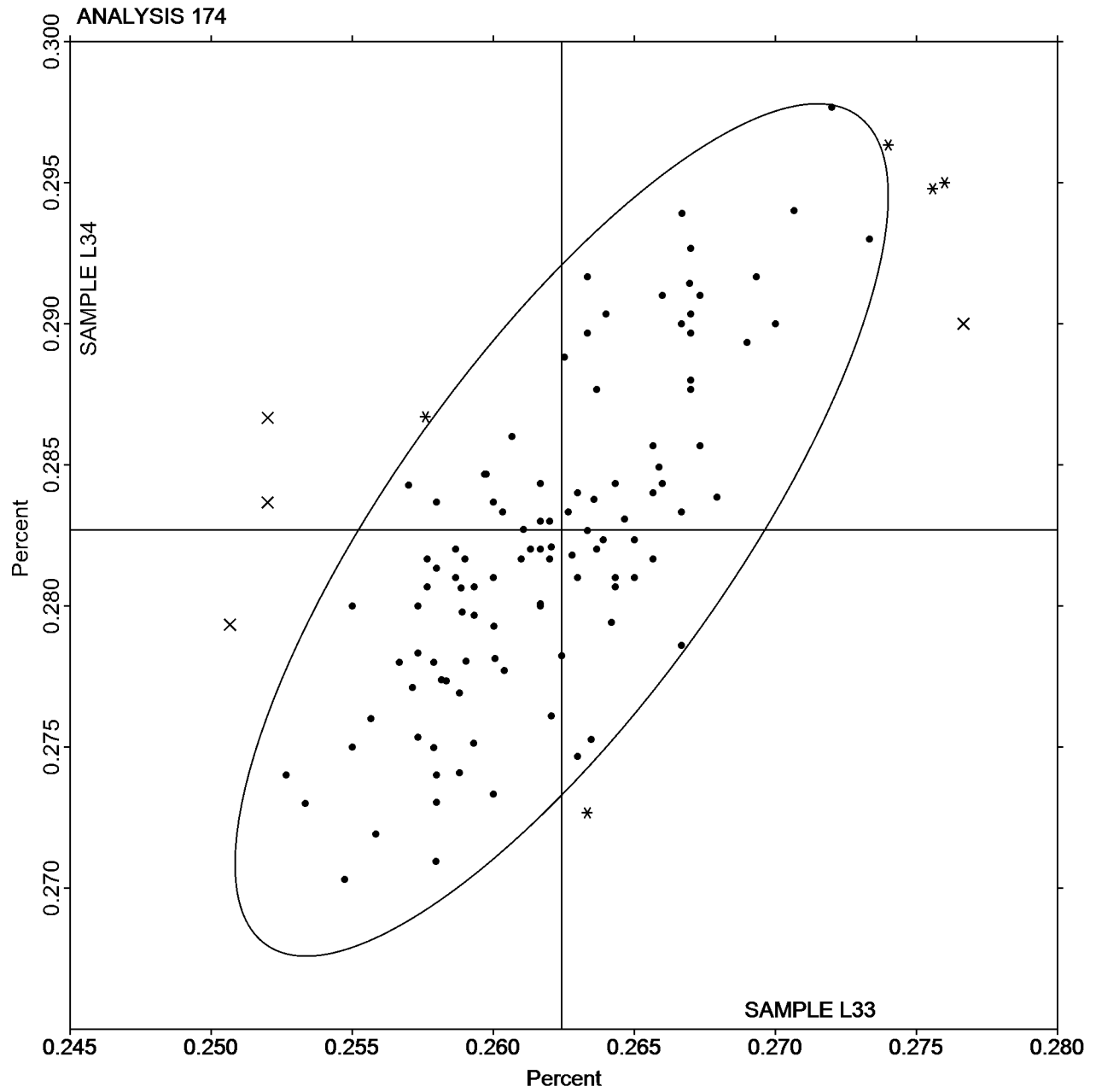
### Interlaboratory Testing Program for Metals

#### Analysis 174

Chemical Analysis Element #5 - Carbon & Low Alloy Steel - Percent SILICON (Si)

SAMPLE L33  
0.2624 Percent

SAMPLE L34  
0.2827 Percent



Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 175

Chemical Analysis Element #6 - Carbon & Low Alloy Steel - Percent  
COPPER (Cu)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.1840	-0.0022	-0.40	0.0823	-0.0013	-0.34	IC
2BTRET		0.1858	-0.0004	-0.07	0.0861	0.0025	0.64	OE
2F36WR		0.1899	0.0037	0.68	0.0828	-0.0009	-0.23	OE
38PFVX		0.1863	0.0001	0.02	0.0837	0.0000	0.00	OE
3CZJGL	*	0.1717	-0.0145	-2.67	0.0809	-0.0028	-0.71	AE
3UZGXV		0.1837	-0.0025	-0.45	0.0839	0.0002	0.06	OE
4M289H		0.1839	-0.0023	-0.42	0.0843	0.0006	0.16	OE
4NAJNY		0.1853	-0.0009	-0.16	0.0837	0.0000	0.00	OE
4VQ34R		0.1921	0.0059	1.09	0.0918	0.0081	2.09	OE
4WMBFH		0.1878	0.0016	0.29	0.0852	0.0016	0.40	OE
4YTYJY		0.1887	0.0025	0.45	0.0840	0.0003	0.09	OE
66DAEE		0.1863	0.0001	0.02	0.0837	0.0001	0.02	GD
6GVUYB	X	0.2267	0.0405	7.44	0.0680	-0.0157	-4.03	OE
6V7LNP		0.1793	-0.0069	-1.26	0.0847	0.0010	0.26	OE
6XFP7R		0.1897	0.0035	0.64	0.0843	0.0007	0.17	OE
736KPB		0.1817	-0.0045	-0.83	0.0817	-0.0020	-0.51	OE
78VWHL		0.1796	-0.0066	-1.22	0.0784	-0.0052	-1.35	OE
7MA7CP		0.1832	-0.0030	-0.54	0.0814	-0.0022	-0.57	IC
87L8PP	*	0.1780	-0.0082	-1.51	0.0725	-0.0112	-2.87	OE
89PW44		0.1920	0.0058	1.07	0.0837	0.0000	0.00	GD
8ALF76		0.1838	-0.0024	-0.44	0.0767	-0.0070	-1.79	OE
8AWK8M	*	0.1963	0.0101	1.86	0.0937	0.0100	2.57	OE
8C7AZK		0.1830	-0.0032	-0.59	0.0827	-0.0010	-0.26	OE
8EUYVD		0.1842	-0.0020	-0.37	0.0827	-0.0010	-0.25	OE
8TW9YM		0.1850	-0.0012	-0.22	0.0890	0.0053	1.37	IC
8XPCNK	*	0.1977	0.0115	2.11	0.0830	-0.0007	-0.17	AA
8ZBDK6		0.1900	0.0038	0.70	0.0833	-0.0003	-0.08	OE
9C4UA7		0.1891	0.0029	0.54	0.0833	-0.0004	-0.09	OE
9U3DPF		0.1908	0.0046	0.84	0.0844	0.0007	0.19	AE
9YGUAQ		0.1900	0.0038	0.70	0.0868	0.0032	0.82	OE
9ZBF4H		0.1863	0.0001	0.02	0.0841	0.0005	0.12	OE
A3ADQF		0.1847	-0.0015	-0.28	0.0810	-0.0027	-0.68	OE
AAV8ZL		0.1910	0.0048	0.88	0.0833	-0.0003	-0.08	OE
AJH6UK		0.1809	-0.0053	-0.97	0.0804	-0.0033	-0.85	OE
ATMD7Q		0.1843	-0.0019	-0.34	0.0833	-0.0003	-0.08	OE
BQELJG		0.1910	0.0048	0.88	0.0860	0.0023	0.60	OE
BUDWFF		0.1927	0.0065	1.19	0.0767	-0.0070	-1.80	OE
C6A2FG		0.1844	-0.0018	-0.33	0.0824	-0.0013	-0.33	OE
CBE463	X	0.2023	0.0161	2.97	0.0993	0.0157	4.03	OE
CJRUZG	X	0.2075	0.0213	3.92	0.0939	0.0102	2.63	OE
CPXKHZ		0.1859	-0.0003	-0.05	0.0806	-0.0030	-0.78	OE
CTW4E7		0.1826	-0.0036	-0.66	0.0806	-0.0031	-0.80	OE
DA2VMG	*	0.2023	0.0161	2.97	0.0902	0.0065	1.68	OE
DKLZXM		0.1897	0.0035	0.64	0.0830	-0.0007	-0.17	OE
DKXXXA		0.1877	0.0015	0.27	0.0874	0.0038	0.97	OE
DMRKN8		0.1893	0.0031	0.57	0.0845	0.0008	0.22	OE
DQQYAC		0.1907	0.0045	0.82	0.0877	0.0040	1.03	OE
DTF2C4		0.1867	0.0005	0.09	0.0790	-0.0047	-1.20	IC
E3VH94		0.1847	-0.0015	-0.28	0.0840	0.0003	0.09	OE

Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 175

Chemical Analysis Element #6 - Carbon & Low Alloy Steel - Percent  
COPPER (Cu)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
E6Z6QE		0.1867	0.0005	0.09	0.0843	0.0007	0.17	OE
EBPJMM		0.1810	-0.0052	-0.96	0.0777	-0.0060	-1.54	AE
EFYZVC		0.1827	-0.0035	-0.65	0.0847	0.0010	0.26	XX
EMLPH8		0.1872	0.0010	0.18	0.0831	-0.0005	-0.14	OE
EVBGTQ		0.1870	0.0008	0.15	0.0847	0.0010	0.26	OE
EYCJRF		0.1893	0.0031	0.58	0.0860	0.0023	0.60	OE
EZQT2F		0.1787	-0.0075	-1.38	0.0812	-0.0024	-0.62	OE
FVTQJ7		0.1867	0.0005	0.09	0.0860	0.0023	0.60	GD
G8KWQA		0.1847	-0.0015	-0.28	0.0880	0.0043	1.12	DR
GLJL7F	X	0.1433	-0.0429	-7.88	0.0710	-0.0127	-3.26	OE
GUU42Y		0.1812	-0.0050	-0.91	0.0784	-0.0053	-1.36	OE
HV2LZV		0.1857	-0.0005	-0.10	0.0823	-0.0013	-0.34	WD
JF4URY		0.1827	-0.0035	-0.65	0.0820	-0.0017	-0.43	OE
JKYNPZ	X	0.2480	0.0618	11.36	0.0933	0.0097	2.49	OE
JM67NV	X	0.1904	0.0042	0.77	0.0973	0.0137	3.52	OE
JR3M3B		0.1803	-0.0059	-1.08	0.0793	-0.0043	-1.11	OE
JTCTD7		0.1827	-0.0035	-0.65	0.0824	-0.0013	-0.32	OE
K4RZPZ		0.1804	-0.0058	-1.06	0.0849	0.0013	0.33	OE
KLQZYK		0.1843	-0.0019	-0.34	0.0888	0.0051	1.31	OE
KM7DDU		0.1763	-0.0099	-1.81	0.0820	-0.0017	-0.44	OE
KRXP6K	*	0.1880	0.0018	0.33	0.0930	0.0093	2.40	XX
KWRJ68		0.1948	0.0086	1.59	0.0930	0.0094	2.41	OE
LCGVJA		0.1884	0.0022	0.40	0.0824	-0.0012	-0.32	OE
LCW84Z		0.1853	-0.0009	-0.16	0.0833	-0.0003	-0.08	OE
M3RPUU		0.1840	-0.0022	-0.40	0.0840	0.0003	0.09	IC
MKN73X		0.1970	0.0108	1.99	0.0890	0.0053	1.37	OE
MUWJD2		0.1833	-0.0029	-0.53	0.0877	0.0040	1.03	OE
N4H4YX		0.1849	-0.0013	-0.23	0.0799	-0.0037	-0.96	OE
NBWWAU		0.1865	0.0003	0.05	0.0836	-0.0001	-0.02	OE
NFQ4EN		0.1757	-0.0105	-1.93	0.0757	-0.0080	-2.05	OE
NMUXMX		0.1860	-0.0002	-0.04	0.0870	0.0033	0.86	OE
NTVAHV		0.1927	0.0065	1.19	0.0820	-0.0017	-0.43	OE
NVNX6W		0.1857	-0.0005	-0.10	0.0833	-0.0003	-0.08	WD
P69Q2Z		0.1917	0.0055	1.01	0.0907	0.0070	1.80	OE
PAH4JY		0.1835	-0.0027	-0.49	0.0832	-0.0005	-0.12	OE
PHRE2B	X	0.1380	-0.0482	-8.86	0.0557	-0.0280	-7.20	AE
PHWPT3	X	0.2050	0.0188	3.46	0.0880	0.0043	1.12	OE
PPD8DB	*	0.1960	0.0098	1.80	0.0823	-0.0013	-0.34	GD
PUMMMY		0.1859	-0.0003	-0.06	0.0840	0.0003	0.08	OE
Q4QWY6		0.1813	-0.0049	-0.89	0.0810	-0.0027	-0.68	DR
QHN98A		0.1787	-0.0075	-1.38	0.0790	-0.0047	-1.20	OE
QPCV3E		0.1826	-0.0036	-0.66	0.0806	-0.0031	-0.79	OE
QU6RR7	X	0.2031	0.0169	3.10	0.0960	0.0123	3.17	OE
RYR2E9		0.1873	0.0011	0.21	0.0810	-0.0027	-0.68	OE
T9WAU9		0.1939	0.0077	1.42	0.0865	0.0029	0.74	OE
TFBGX4		0.1914	0.0052	0.96	0.0897	0.0060	1.55	OE
U9U6HH	*	0.2000	0.0138	2.54	0.0880	0.0043	1.12	GD
U9VYDW	*	0.1919	0.0057	1.04	0.0937	0.0100	2.58	OE
UAQGEX	X	0.1380	-0.0482	-8.86	0.0553	-0.0283	-7.29	AE



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 175

Chemical Analysis Element #6 - Carbon & Low Alloy Steel - Percent  
COPPER (Cu)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UY3PNY		0.1877	0.0015	0.27	0.0837	0.0000	0.00	OE
UZDQHX		0.1760	-0.0102	-1.87	0.0813	-0.0023	-0.60	OE
V9NB83		0.1840	-0.0022	-0.40	0.0824	-0.0013	-0.33	OE
VAKJJT		0.1907	0.0045	0.82	0.0920	0.0083	2.15	OE
VBF3LU		0.1850	-0.0012	-0.22	0.0830	-0.0007	-0.17	OE
VF7JVY		0.1829	-0.0033	-0.61	0.0799	-0.0037	-0.96	OE
VLYJDZ		0.1777	-0.0085	-1.57	0.0850	0.0013	0.34	OE
VPBQBY		0.1820	-0.0042	-0.77	0.0825	-0.0012	-0.30	OE
VYXN7J		0.1913	0.0051	0.94	0.0863	0.0027	0.69	OE
VZVYDU	*	0.1720	-0.0142	-2.61	0.0803	-0.0033	-0.86	OE
WAVPJM		0.1873	0.0011	0.21	0.0828	-0.0009	-0.22	OE
WLA3B3		0.1757	-0.0105	-1.94	0.0747	-0.0090	-2.31	XX
WRH6P6		0.1845	-0.0017	-0.31	0.0798	-0.0038	-0.98	WD
WUNL4N		0.1857	-0.0005	-0.10	0.0823	-0.0013	-0.34	OE
WYJDCK		0.1900	0.0038	0.70	0.0900	0.0063	1.63	OE
WZP48T		0.1837	-0.0025	-0.47	0.0783	-0.0053	-1.37	GD
X79QBX		0.1890	0.0028	0.51	0.0783	-0.0053	-1.37	AE
XELLLJ		0.1850	-0.0012	-0.22	0.0813	-0.0023	-0.60	OE
XRAHYP		0.1843	-0.0019	-0.34	0.0843	0.0007	0.17	XX
Y7P7AK		0.1957	0.0095	1.74	0.0867	0.0030	0.77	OE
YQYZ6W		0.1850	-0.0012	-0.22	0.0773	-0.0063	-1.63	GD
ZD9LMF		0.1937	0.0075	1.37	0.0837	0.0000	0.00	IC
ZPXLEH		0.1937	0.0075	1.37	0.0833	-0.0003	-0.08	OE
ZRNQZP	X	0.2097	0.0235	4.31	0.0947	0.0110	2.84	OE
ZTV68V		0.1850	-0.0012	-0.22	0.0827	-0.0010	-0.26	IC
ZVM6AK		0.1863	0.0001	0.02	0.0830	-0.0007	-0.17	IC

Summary Statistics				
	<u>Sample L33</u>		<u>Sample L34</u>	
Grand Means	0.1862	Percent	0.0836	Percent
Std Dev Btwn Labs	0.0054	Percent	0.0039	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 112 of 124 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 175  
Chemical Analysis Element #6 - Carbon & Low Alloy Steel - Percent  
COPPER (Cu)

**Comments on assigned Data Flags for Analysis #175**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
6GVUYB	X	Data for sample L33 are high and data for sample L34 are low. Inconsistent within the determinations of sample L33.
CBE463	X	Data for both samples are high.
CJRUZG	X	Data for sample L33 are high. Inconsistent within the determinations of sample L33.
GLJL7F	X	Data for both samples are low.
JKYNPZ	X	Data for sample L33 are high.
JM67NV	X	Data for sample L34 are high.
PHRE2B	X	Data for both samples are low.
PHWPT3	X	Data for sample L33 are high.
QU6RR7	X	Data for both samples are high.
UAQGEX	X	Data for both samples are low.
ZRNQZP	X	Data for both samples are high.

Cycle 113  
1st Q, 2016

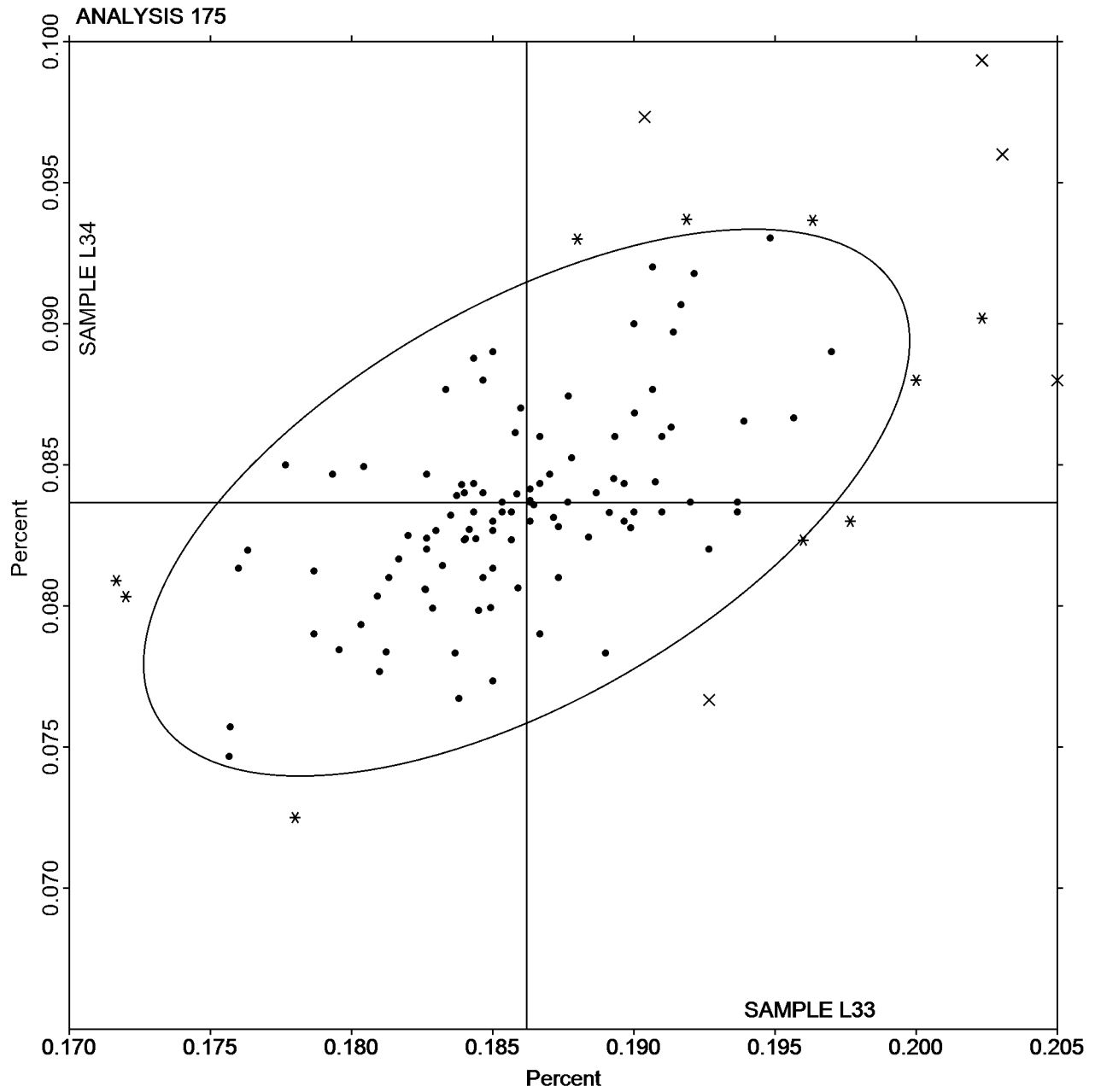
### Interlaboratory Testing Program for Metals

#### Analysis 175

Chemical Analysis Element #6 - Carbon & Low Alloy Steel - Percent  
COPPER (Cu)

SAMPLE L33  
0.1862 Percent

SAMPLE L34  
0.0836 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 176

Chemical Analysis Element #7 - Carbon & Low Alloy Steel - Percent  
NICKEL (Ni)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		1.817	0.000	0.02	1.867	0.005	0.19	IC
2BTRET		1.816	-0.001	-0.02	1.847	-0.014	-0.47	OE
2F36WR		1.843	0.027	1.04	1.883	0.022	0.74	OE
38PFVX		1.819	0.003	0.12	1.869	0.008	0.26	OE
3CZJGL		1.810	-0.006	-0.24	1.850	-0.011	-0.38	AE
3UZGXV		1.817	0.000	0.02	1.866	0.005	0.16	OE
4M289H		1.816	0.000	-0.01	1.869	0.008	0.26	OE
4NAJNY		1.806	-0.011	-0.41	1.851	-0.011	-0.36	OE
4VQ34R	X	1.720	-0.097	-3.76	1.729	-0.132	-4.48	OE
4WMBFH		1.808	-0.009	-0.33	1.843	-0.018	-0.61	XX
4YTYJY		1.800	-0.016	-0.63	1.853	-0.008	-0.27	OE
66DAEE	X	1.843	0.027	1.06	1.977	0.115	3.91	GD
6GVUYB		1.833	0.017	0.67	1.870	0.009	0.30	OE
6V7LNP		1.815	-0.001	-0.05	1.880	0.018	0.63	OE
6XFP7R		1.821	0.004	0.17	1.863	0.002	0.06	OE
736KPB		1.820	0.004	0.15	1.857	-0.005	-0.15	OE
78VWHL	*	1.758	-0.058	-2.25	1.776	-0.085	-2.88	OE
7MA7CP		1.826	0.010	0.39	1.866	0.005	0.16	IC
87L8PP	*	1.817	0.000	0.02	1.807	-0.055	-1.85	OE
89PW44		1.793	-0.023	-0.89	1.873	0.012	0.41	GD
8ALF76		1.803	-0.013	-0.51	1.874	0.013	0.44	OE
8C7AZK		1.793	-0.023	-0.89	1.834	-0.028	-0.93	OE
8EUYVD		1.820	0.004	0.17	1.863	0.002	0.07	OE
8TW9YM		1.814	-0.002	-0.08	1.871	0.010	0.33	IC
8XPCNK		1.777	-0.040	-1.54	1.837	-0.025	-0.83	AA
8ZBDK6		1.817	0.000	0.02	1.863	0.002	0.07	OE
9C4UA7		1.802	-0.014	-0.56	1.845	-0.016	-0.55	OE
9U3DPF		1.800	-0.016	-0.63	1.833	-0.028	-0.94	AE
9YGUAQ		1.840	0.024	0.93	1.881	0.019	0.66	OE
9ZBF4H		1.816	0.000	-0.01	1.881	0.020	0.68	OE
AAV8ZL		1.788	-0.029	-1.11	1.826	-0.036	-1.20	OE
AJH6UK		1.806	-0.010	-0.39	1.856	-0.005	-0.19	OE
ATMD7Q		1.794	-0.022	-0.86	1.837	-0.024	-0.81	OE
BQELJG	*	1.834	0.018	0.69	1.830	-0.031	-1.06	OE
BUDWFF		1.823	0.007	0.28	1.889	0.027	0.93	OE
C6A2FG		1.834	0.018	0.69	1.875	0.014	0.48	OE
CBE463		1.798	-0.018	-0.69	1.857	-0.005	-0.15	OE
CJRUZG		1.868	0.051	2.00	1.904	0.043	1.44	OE
CPXKHZ	*	1.810	-0.007	-0.25	1.807	-0.055	-1.85	OE
CTW4E7		1.806	-0.010	-0.40	1.857	-0.004	-0.15	OE
DA2VMG	X	1.270	-0.546	-21.24	1.300	-0.561	-19.00	OE
DKLZXM		1.787	-0.030	-1.15	1.851	-0.010	-0.35	OE
DKXXXA		1.802	-0.014	-0.55	1.844	-0.017	-0.59	OE
DMRKN8		1.788	-0.028	-1.09	1.824	-0.038	-1.28	OE
DQQYAC		1.824	0.008	0.32	1.878	0.017	0.58	OE
DTF2C4		1.834	0.018	0.71	1.907	0.046	1.55	IC
E3VH94		1.793	-0.023	-0.89	1.880	0.019	0.64	OE
E6Z6QE		1.797	-0.019	-0.75	1.844	-0.017	-0.58	OE
EBPJMM		1.844	0.028	1.09	1.890	0.028	0.96	AE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 176

Chemical Analysis Element #7 - Carbon & Low Alloy Steel - Percent  
NICKEL (Ni)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EFYZVC		1.848	0.032	1.25	1.888	0.026	0.90	XX
EMLPH8		1.786	-0.030	-1.18	1.833	-0.028	-0.97	OE
EVBGTQ		1.832	0.016	0.62	1.859	-0.002	-0.08	OE
EYCJRF		1.823	0.007	0.28	1.887	0.025	0.86	OE
FVTQJ7		1.810	-0.006	-0.24	1.880	0.019	0.64	GD
G8KWQA		1.816	0.000	0.01	1.868	0.006	0.22	DR
GLJL7F		1.823	0.007	0.28	1.853	-0.008	-0.27	OE
GUU42Y	X	1.724	-0.092	-3.59	1.788	-0.073	-2.49	OE
HV2LZV		1.812	-0.005	-0.18	1.849	-0.012	-0.41	WD
JF4URY		1.783	-0.033	-1.28	1.827	-0.034	-1.15	OE
JKYNPZ		1.833	0.017	0.67	1.850	-0.011	-0.38	OE
JM67NV		1.856	0.040	1.55	1.865	0.004	0.12	OE
JR3M3B		1.878	0.062	2.42	1.905	0.044	1.48	OE
JTCTD7		1.760	-0.056	-2.18	1.863	0.002	0.07	OE
K4RZPZ		1.817	0.001	0.03	1.875	0.013	0.46	OE
KLQZYK		1.811	-0.006	-0.21	1.867	0.005	0.19	OE
KM7DDU		1.770	-0.046	-1.80	1.817	-0.045	-1.51	OE
KRXP6K		1.800	-0.016	-0.63	1.830	-0.031	-1.06	XX
KWRJ68		1.804	-0.013	-0.49	1.845	-0.016	-0.54	OE
LCGVJA		1.820	0.003	0.14	1.862	0.001	0.04	OE
LCW84Z		1.816	0.000	0.01	1.850	-0.012	-0.39	OE
M3RPUU		1.824	0.008	0.32	1.873	0.012	0.40	IC
MKN73X		1.858	0.042	1.63	1.904	0.042	1.44	OE
MUWJD2		1.817	0.000	0.02	1.853	-0.008	-0.27	OE
NBWWAU		1.804	-0.012	-0.47	1.874	0.012	0.42	OE
NFQ4EN		1.846	0.030	1.17	1.899	0.038	1.28	OE
NMUXMX		1.803	-0.013	-0.50	1.850	-0.011	-0.38	OE
NTVAHV	X	1.811	-0.005	-0.19	1.773	-0.088	-2.99	OE
NVNX6W		1.824	0.008	0.30	1.855	-0.006	-0.21	WD
P69Q2Z		1.826	0.009	0.37	1.860	-0.002	-0.05	OE
PAH4JY		1.828	0.012	0.46	1.887	0.026	0.88	OE
PHRE2B		1.770	-0.046	-1.78	1.801	-0.060	-2.04	AE
PHWPT3		1.800	-0.016	-0.63	1.940	0.079	2.67	XX
PPD8DB		1.803	-0.013	-0.50	1.870	0.009	0.30	GD
PUMMMY		1.790	-0.026	-1.00	1.849	-0.012	-0.41	OE
Q4QWY6		1.760	-0.056	-2.17	1.808	-0.054	-1.81	DR
Q9ZFNB		1.817	0.001	0.03	1.863	0.002	0.05	XX
QHN98A		1.782	-0.034	-1.32	1.837	-0.025	-0.83	OE
QPCV3E		1.791	-0.025	-0.97	1.822	-0.039	-1.32	OE
QU6RR7	*	1.827	0.011	0.43	1.923	0.062	2.08	OE
RYR2E9		1.777	-0.039	-1.52	1.813	-0.049	-1.64	OE
RYVHLT	*	1.863	0.047	1.82	1.870	0.009	0.30	ED
T9WAU9	*	1.891	0.075	2.93	1.936	0.075	2.55	OE
TFBGX4		1.839	0.023	0.90	1.888	0.027	0.90	OE
U9U6HH		1.840	0.024	0.93	1.910	0.049	1.65	GD
U9VYDW		1.864	0.048	1.86	1.898	0.037	1.24	OE
UAQGEX		1.773	-0.043	-1.68	1.801	-0.060	-2.03	AE
UY3PNY	*	1.886	0.069	2.70	1.899	0.037	1.27	OE
UZDQHX		1.813	-0.004	-0.14	1.887	0.026	0.87	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 176

Chemical Analysis Element #7 - Carbon & Low Alloy Steel - Percent  
NICKEL (Ni)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
V9NB83		1.766	-0.050	-1.95	1.827	-0.034	-1.15	OE
VAKJJT		1.807	-0.010	-0.37	1.850	-0.011	-0.37	OE
VBF3LU		1.820	0.004	0.15	1.860	-0.001	-0.04	OE
VF7JVY	X	1.910	0.093	3.63	1.879	0.018	0.61	OE
VPBQBY		1.820	0.004	0.15	1.853	-0.008	-0.28	OE
VYXN7J	X	1.898	0.082	3.19	1.808	-0.054	-1.81	OE
VZVYDU		1.843	0.027	1.06	1.872	0.011	0.37	OE
WAVPJM		1.827	0.010	0.41	1.850	-0.011	-0.38	OE
WLA3B3		1.845	0.029	1.12	1.914	0.053	1.79	OE
WRH6P6		1.806	-0.010	-0.40	1.821	-0.041	-1.37	WD
WUNL4N		1.867	0.051	1.99	1.913	0.052	1.77	OE
WYJDCK		1.780	-0.036	-1.41	1.837	-0.025	-0.83	OE
WZP48T		1.837	0.020	0.80	1.907	0.045	1.54	GD
X79QBX		1.793	-0.023	-0.89	1.883	0.022	0.75	AE
XELLJ		1.786	-0.030	-1.17	1.808	-0.053	-1.80	OE
XRAHYP		1.813	-0.003	-0.12	1.856	-0.005	-0.18	XX
Y7P7AK		1.866	0.050	1.94	1.920	0.059	2.00	OE
YQYZ6W		1.813	-0.003	-0.11	1.900	0.039	1.31	GD
YW38KZ	*	1.823	0.007	0.28	1.820	-0.041	-1.40	OE
ZD9LMF		1.843	0.027	1.06	1.897	0.035	1.20	IC
ZPXLEH		1.816	-0.001	-0.02	1.866	0.005	0.17	OE
ZRNQZP		1.823	0.007	0.28	1.870	0.009	0.30	OE
ZTV68V		1.814	-0.002	-0.08	1.858	-0.004	-0.12	IC
ZVM6AK		1.814	-0.002	-0.08	1.870	0.009	0.31	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	1.816	Percent	1.861	Percent
Std Dev Btwn Labs	0.026	Percent	0.030	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 113 of 122 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 176  
Chemical Analysis Element #7 - Carbon & Low Alloy Steel - Percent  
NICKEL (Ni)

**Comments on assigned Data Flags for Analysis #176**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
4VQ34R	X	Data for both samples are low. Inconsistent within the determinations of sample L33.
66DAEE	X	Data for sample L34 are high.
DA2VMG	X	Data for both samples are low.
GUU42Y	X	Data for sample L33 are low.
NTVAHV	X	Data for sample L34 are low.
VF7JVY	X	Data for sample L33 are high.
VYXN7J	X	Data for sample L33 are high.

Cycle 113  
1st Q, 2016

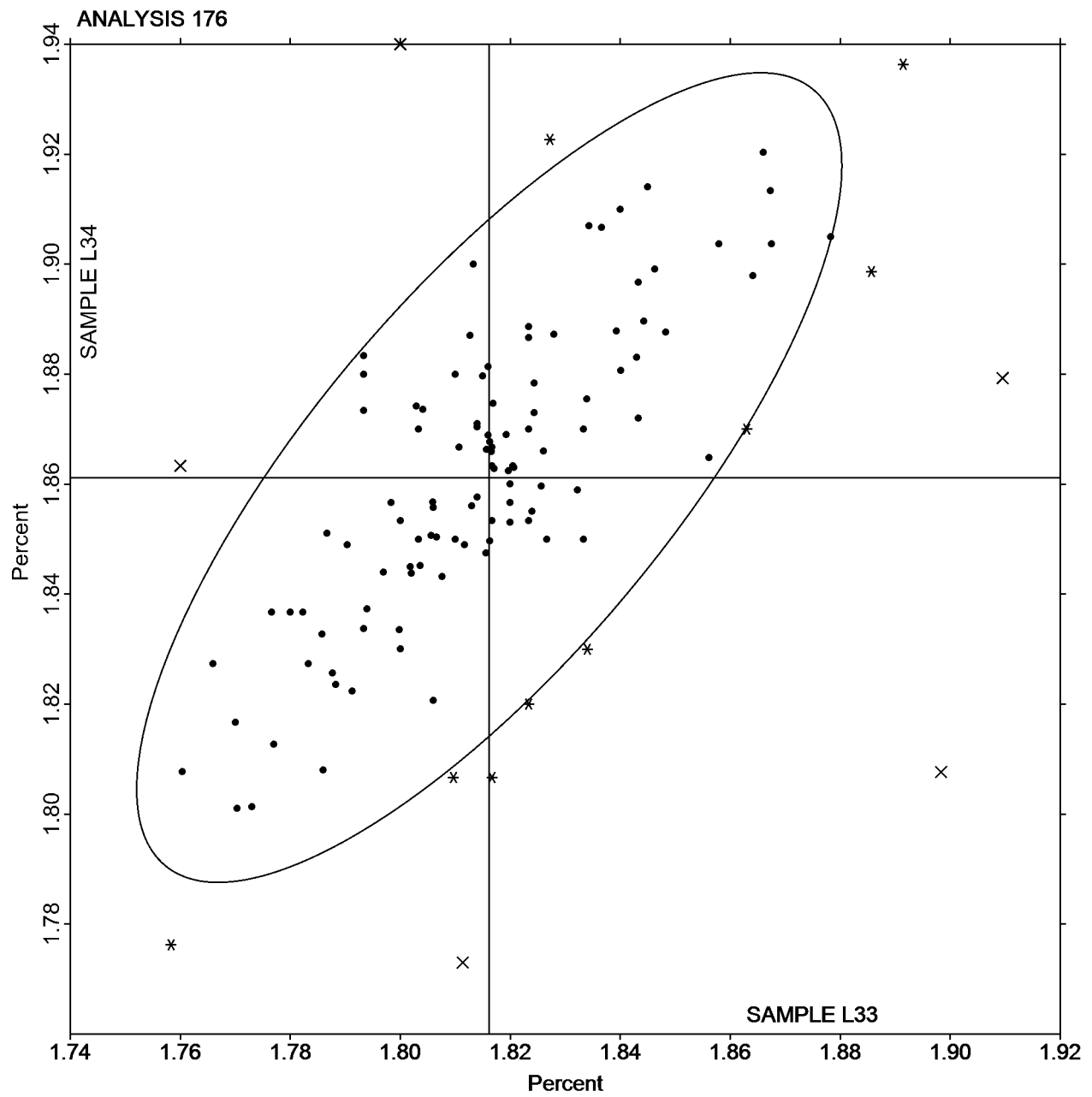
# Interlaboratory Testing Program for Metals

## Analysis 176

Chemical Analysis Element #7 - Carbon & Low Alloy Steel - Percent  
NICKEL (Ni)

SAMPLE L33  
1.816 Percent

SAMPLE L34  
1.861 Percent





Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 177

Chemical Analysis Element #8 - Carbon & Low Alloy Steel - Percent  
CHROMIUM (Cr)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.8190	-0.0019	-0.16	0.8067	-0.0015	-0.11	IC
2BTRET		0.8179	-0.0030	-0.26	0.7996	-0.0086	-0.62	OE
2F36WR		0.8125	-0.0083	-0.73	0.7957	-0.0125	-0.90	OE
38PFVX		0.8180	-0.0029	-0.25	0.8060	-0.0022	-0.16	OE
3CZJGL	*	0.7917	-0.0292	-2.54	0.7770	-0.0312	-2.25	AE
3UZGXV		0.8258	0.0049	0.43	0.8083	0.0001	0.01	OE
4M289H		0.8238	0.0029	0.26	0.8059	-0.0023	-0.17	OE
4NAJNY		0.8070	-0.0139	-1.21	0.7973	-0.0109	-0.78	OE
4VQ34R	X	0.7685	-0.0524	-4.56	0.7683	-0.0399	-2.88	OE
4WMBFH		0.8280	0.0072	0.63	0.8162	0.0080	0.58	OE
4YTYJY		0.8127	-0.0082	-0.71	0.7977	-0.0105	-0.76	OE
66DAEE	X	0.8583	0.0375	3.27	0.8307	0.0225	1.62	GD
6GVUYB		0.8167	-0.0042	-0.37	0.8267	0.0185	1.33	OE
6V7LNP		0.8173	-0.0035	-0.31	0.8053	-0.0029	-0.21	OE
6XFP7R		0.8123	-0.0085	-0.74	0.7997	-0.0085	-0.62	OE
736KPB		0.8100	-0.0109	-0.95	0.7933	-0.0149	-1.07	OE
78VWHL		0.7990	-0.0219	-1.91	0.7758	-0.0324	-2.34	OE
7MA7CP		0.8401	0.0192	1.68	0.8249	0.0167	1.20	IC
87L8PP		0.8163	-0.0045	-0.39	0.7987	-0.0095	-0.69	OE
89PW44		0.8120	-0.0089	-0.77	0.7947	-0.0135	-0.98	GD
8ALF76		0.7999	-0.0209	-1.82	0.7842	-0.0240	-1.74	OE
8C7AZK		0.8020	-0.0189	-1.64	0.7910	-0.0172	-1.24	OE
8EUYVD		0.8233	0.0024	0.21	0.8067	-0.0015	-0.11	OE
8TW9YM		0.8277	0.0068	0.59	0.8283	0.0201	1.46	IC
8XPCNK	*	0.8133	-0.0075	-0.66	0.7833	-0.0249	-1.80	OE
8ZBDK6		0.8233	0.0025	0.22	0.8133	0.0051	0.37	OE
9C4UA7		0.8106	-0.0102	-0.89	0.8004	-0.0078	-0.56	OE
9U3DPF		0.8296	0.0087	0.76	0.8123	0.0041	0.30	AE
9YGUAQ		0.8229	0.0020	0.18	0.8171	0.0089	0.64	OE
9ZBF4H		0.8230	0.0021	0.19	0.8010	-0.0072	-0.52	OE
AAV8ZL		0.8263	0.0055	0.48	0.8150	0.0068	0.49	OE
AJH6UK		0.8075	-0.0133	-1.16	0.8009	-0.0073	-0.53	OE
ATMD7Q		0.8237	0.0028	0.24	0.8150	0.0068	0.49	OE
BQELJG		0.8253	0.0045	0.39	0.8157	0.0075	0.54	OE
BUDWFF		0.8200	-0.0009	-0.07	0.8200	0.0118	0.85	OE
C6A2FG		0.8190	-0.0019	-0.16	0.8044	-0.0038	-0.27	OE
CBE463		0.8073	-0.0135	-1.18	0.7947	-0.0135	-0.98	OE
CJRUZG	*	0.8552	0.0343	2.99	0.8430	0.0348	2.51	OE
CPXKHZ		0.8033	-0.0175	-1.53	0.7933	-0.0149	-1.07	OE
CTW4E7		0.8164	-0.0045	-0.39	0.8101	0.0019	0.14	OE
DA2VMG		0.8230	0.0021	0.19	0.8080	-0.0002	-0.01	OE
DKLZXM		0.8030	-0.0179	-1.56	0.7950	-0.0132	-0.95	OE
DKXXXA		0.8301	0.0092	0.80	0.8142	0.0060	0.43	OE
DMRKN8		0.8170	-0.0039	-0.34	0.8056	-0.0026	-0.19	OE
DQQYAC		0.8123	-0.0085	-0.74	0.8040	-0.0042	-0.30	OE
DTF2C4		0.8267	0.0058	0.51	0.8280	0.0198	1.43	IC
E3VH94		0.8200	-0.0009	-0.07	0.8133	0.0051	0.37	OE
E6Z6QE		0.8060	-0.0149	-1.30	0.7877	-0.0205	-1.48	OE
EBPJMM		0.8067	-0.0142	-1.24	0.7977	-0.0105	-0.76	AE

Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 177

Chemical Analysis Element #8 - Carbon & Low Alloy Steel - Percent  
CHROMIUM (Cr)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EFYZVC	*	0.8430	0.0221	1.93	0.8213	0.0131	0.95	XX
EMLPH8		0.8131	-0.0078	-0.68	0.8001	-0.0081	-0.58	OE
EVBGTQ		0.8176	-0.0033	-0.28	0.8143	0.0061	0.44	OE
EYCJRF		0.8257	0.0048	0.42	0.8200	0.0118	0.85	OE
FVTQJ7		0.8123	-0.0085	-0.74	0.7937	-0.0145	-1.05	GD
G8KWQA		0.8443	0.0235	2.05	0.8310	0.0228	1.65	DR
GLJL7F		0.8167	-0.0042	-0.37	0.8067	-0.0015	-0.11	OE
GUU42Y		0.8126	-0.0082	-0.72	0.8025	-0.0057	-0.41	OE
HV2LZV		0.8167	-0.0042	-0.37	0.8037	-0.0045	-0.33	WD
JF4URY		0.8337	0.0128	1.12	0.8170	0.0088	0.64	OE
JKYNPZ		0.8173	-0.0035	-0.31	0.7990	-0.0092	-0.66	OE
JM67NV		0.8241	0.0033	0.29	0.8019	-0.0063	-0.45	OE
JR3M3B		0.8307	0.0098	0.86	0.8147	0.0065	0.47	OE
JTCTD7		0.8220	0.0011	0.10	0.8130	0.0048	0.35	OE
K4RZPZ		0.8187	-0.0022	-0.19	0.8167	0.0085	0.61	OE
KLQZYK		0.8217	0.0008	0.07	0.8080	-0.0002	-0.01	OE
KM7DDU	*	0.8120	-0.0089	-0.77	0.7817	-0.0265	-1.92	OE
KRXP6K		0.8310	0.0101	0.88	0.8160	0.0078	0.56	XX
KWRJ68		0.8280	0.0071	0.62	0.8145	0.0063	0.46	OE
LCGVJA		0.8252	0.0044	0.38	0.8165	0.0083	0.60	OE
LCW84Z		0.8330	0.0121	1.06	0.8230	0.0148	1.07	OE
M3RPUU		0.8247	0.0038	0.33	0.8123	0.0041	0.30	IC
MKN73X		0.8317	0.0108	0.94	0.8190	0.0108	0.78	OE
MUWJD2	X	0.7700	-0.0509	-4.43	0.7667	-0.0415	-3.00	OE
N4H4YX		0.8182	-0.0027	-0.23	0.8073	-0.0009	-0.06	OE
NBWWAU		0.8208	-0.0001	0.00	0.8167	0.0085	0.61	OE
NFQ4EN		0.8190	-0.0019	-0.16	0.8054	-0.0028	-0.20	OE
NMUXMX		0.8073	-0.0135	-1.18	0.7957	-0.0125	-0.90	OE
NTVAHV		0.8110	-0.0099	-0.86	0.7863	-0.0219	-1.58	OE
NVNX6W		0.8253	0.0045	0.39	0.8137	0.0055	0.40	WD
P69Q2Z		0.8247	0.0038	0.33	0.8050	-0.0032	-0.23	OE
PAH4JY		0.7967	-0.0242	-2.11	0.7844	-0.0238	-1.72	OE
PHRE2B		0.8130	-0.0079	-0.68	0.7960	-0.0122	-0.88	AE
PHWPT3	X	0.8200	-0.0009	-0.07	0.7100	-0.0982	-7.09	OE
PPD8DB		0.8340	0.0131	1.15	0.8303	0.0221	1.60	GD
PUMMMY		0.8244	0.0035	0.31	0.8163	0.0081	0.58	OE
Q4QWY6		0.8103	-0.0105	-0.92	0.8050	-0.0032	-0.23	DR
Q9ZFNB	*	0.8163	-0.0046	-0.40	0.8204	0.0123	0.89	OE
QHN98A		0.8213	0.0005	0.04	0.8070	-0.0012	-0.09	OE
QPCV3E		0.8186	-0.0023	-0.20	0.8056	-0.0026	-0.19	OE
QU6RR7		0.8181	-0.0027	-0.24	0.8018	-0.0064	-0.46	OE
RYR2E9		0.8300	0.0091	0.80	0.8203	0.0121	0.88	OE
RYVHLT	X	0.8577	0.0368	3.21	0.8250	0.0168	1.21	ED
T9WAU9		0.8228	0.0020	0.17	0.8134	0.0052	0.38	OE
TFBGX4		0.8204	-0.0004	-0.04	0.8157	0.0075	0.55	OE
U9U6HH	*	0.8467	0.0258	2.25	0.8233	0.0151	1.09	GD
U9VYDW		0.8153	-0.0056	-0.49	0.7972	-0.0110	-0.80	XX
UAQGEX		0.8127	-0.0082	-0.71	0.7960	-0.0122	-0.88	AE
UY3PNY		0.8277	0.0068	0.59	0.8100	0.0018	0.13	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 177

Chemical Analysis Element #8 - Carbon & Low Alloy Steel - Percent  
CHROMIUM (Cr)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UZDQHX	*	0.8410	0.0201	1.76	0.8410	0.0328	2.37	OE
V9NB83		0.8410	0.0201	1.76	0.8250	0.0168	1.21	OE
VAKJJT		0.8200	-0.0009	-0.07	0.8037	-0.0045	-0.33	OE
VBF3LU		0.8250	0.0041	0.36	0.8150	0.0068	0.49	XX
VF7JVY	X	0.8150	-0.0058	-0.51	0.8406	0.0324	2.34	OE
VPBQBY		0.8360	0.0151	1.32	0.8210	0.0128	0.93	OE
VYXN7J		0.8070	-0.0139	-1.21	0.7890	-0.0192	-1.39	OE
VZVYDU	*	0.8417	0.0208	1.81	0.8433	0.0351	2.54	OE
WAVPJM		0.8193	-0.0015	-0.13	0.8027	-0.0055	-0.40	OE
WLA3B3		0.8220	0.0011	0.10	0.8097	0.0015	0.11	OE
WRH6P6		0.8218	0.0009	0.08	0.7999	-0.0083	-0.60	WD
WUNL4N		0.8150	-0.0059	-0.51	0.7997	-0.0085	-0.62	OE
WYJDCK		0.8200	-0.0009	-0.07	0.8033	-0.0049	-0.35	OE
WZP48T	*	0.8477	0.0268	2.34	0.8487	0.0405	2.92	GD
X79QBX		0.8190	-0.0019	-0.16	0.8020	-0.0062	-0.45	AE
XELLLJ		0.8387	0.0178	1.55	0.8253	0.0171	1.24	OE
XRAHYP	*	0.8280	0.0071	0.62	0.8007	-0.0075	-0.54	XX
Y7P7AK		0.8450	0.0241	2.10	0.8350	0.0268	1.94	OE
YQYZ6W		0.8027	-0.0182	-1.59	0.7870	-0.0212	-1.53	GD
YW38KZ		0.8200	-0.0009	-0.07	0.8067	-0.0015	-0.11	OE
ZD9LMF		0.8370	0.0161	1.41	0.8333	0.0251	1.82	IC
ZPXLEH	X	0.8650	0.0441	3.85	0.8340	0.0258	1.86	OE
ZRNQZP		0.8050	-0.0159	-1.38	0.7967	-0.0115	-0.83	OE
ZTV68V		0.8250	0.0041	0.36	0.8137	0.0055	0.40	IC
ZVM6AK		0.8227	0.0018	0.16	0.8140	0.0058	0.42	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.8209	Percent	0.8082	Percent
Std Dev Btwn Labs	0.0115	Percent	0.0138	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 115 of 123 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 177  
Chemical Analysis Element #8 - Carbon & Low Alloy Steel - Percent  
CHROMIUM (Cr)

**Comments on assigned Data Flags for Analysis #177**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
4VQ34R	X	Data for both samples are low.
66DAEE	X	Data for sample L33 are high.
MUWJD2	X	Data for both samples are low.
PHWPT3	X	Data for sample L34 are low.
RYVHLT	X	Data for sample L33 are high. Inconsistent within the determinations of sample L33.
VF7JVY	X	Inconsistent in testing between samples. Inconsistent within the determinations of sample L34.
ZPXLEH	X	Data for sample L33 are high. Inconsistent within the determinations of both samples.

Cycle 113  
1st Q, 2016

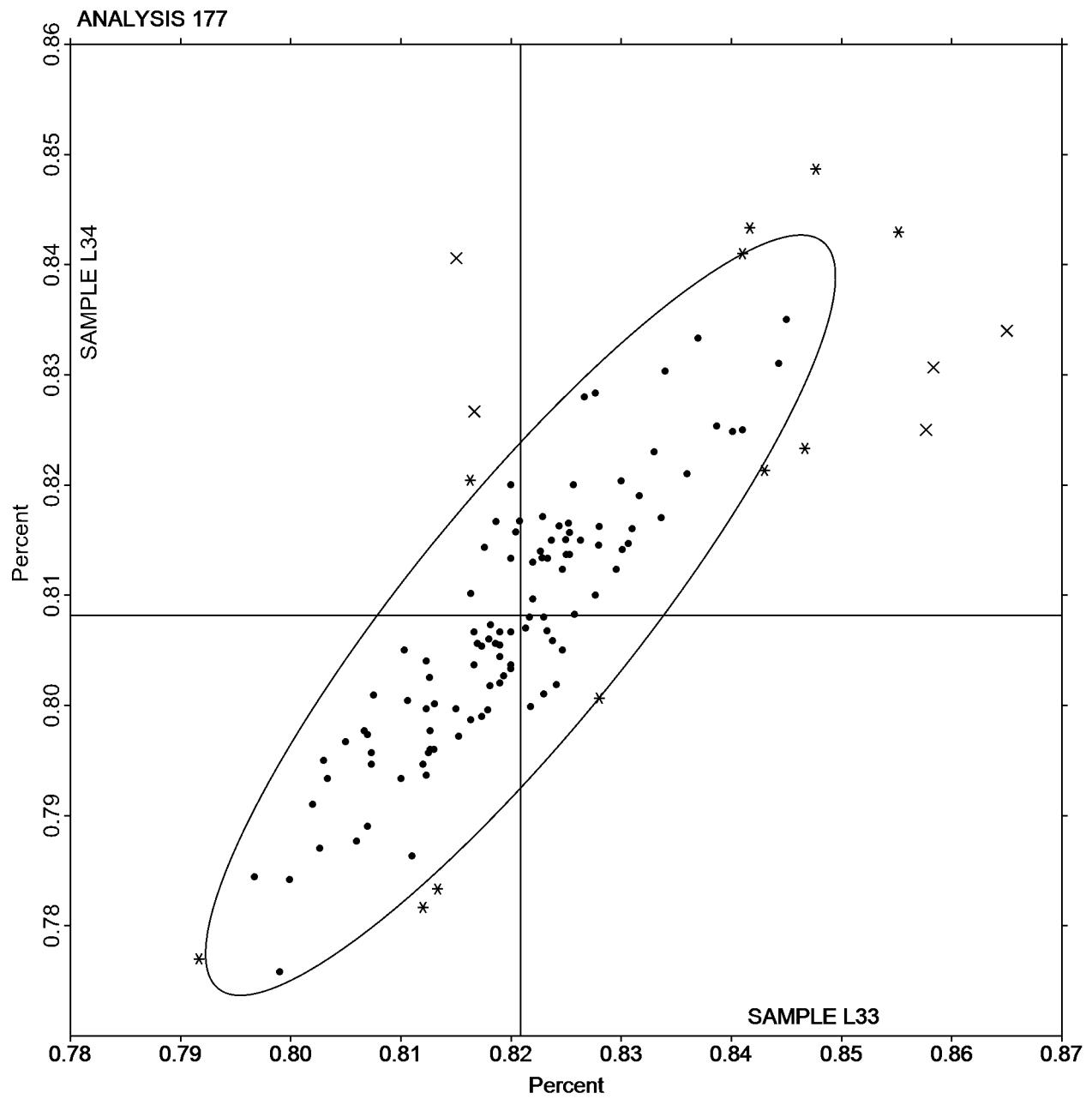
### Interlaboratory Testing Program for Metals

#### Analysis 177

Chemical Analysis Element #8 - Carbon & Low Alloy Steel - Percent  
CHROMIUM (Cr)

SAMPLE L33  
0.8209 Percent

SAMPLE L34  
0.8082 Percent



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 178

Chemical Analysis Element #9 - Carbon & Low Alloy Steel - Percent  
ALUMINUM (Al)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.0203	-0.0007	-0.49	0.0260	0.0031	2.13	IC
2BTRET		0.0205	-0.0006	-0.40	0.0221	-0.0007	-0.50	OE
2F36WR	*	0.0168	-0.0043	-2.93	0.0196	-0.0033	-2.24	OE
38PFVX		0.0221	0.0011	0.74	0.0241	0.0012	0.84	OE
3CZJGL		0.0213	0.0003	0.20	0.0238	0.0010	0.66	AE
3UZGXV		0.0222	0.0011	0.77	0.0251	0.0022	1.49	OE
4M289H		0.0227	0.0017	1.16	0.0254	0.0025	1.70	OE
4NAJNY		0.0201	-0.0009	-0.65	0.0220	-0.0008	-0.57	OE
4VQ34R	X	0.0241	0.0031	2.09	0.0313	0.0085	5.75	OE
4WMBFH		0.0217	0.0007	0.47	0.0242	0.0014	0.93	XX
4YTYJY		0.0200	-0.0010	-0.72	0.0220	-0.0009	-0.59	OE
66DAEE		0.0209	-0.0002	-0.12	0.0232	0.0004	0.25	GD
6GVUYB	*	0.0227	0.0016	1.11	0.0224	-0.0004	-0.29	OE
6V7LNP		0.0212	0.0002	0.13	0.0236	0.0008	0.52	OE
6XFP7R		0.0213	0.0003	0.20	0.0236	0.0007	0.50	OE
736KPB		0.0210	0.0000	-0.03	0.0223	-0.0005	-0.36	OE
78VWHL		0.0212	0.0002	0.10	0.0227	-0.0001	-0.09	OE
7MA7CP		0.0197	-0.0014	-0.95	0.0208	-0.0020	-1.38	IC
87L8PP		0.0200	-0.0010	-0.72	0.0227	-0.0002	-0.14	OE
89PW44		0.0200	-0.0010	-0.72	0.0210	-0.0019	-1.27	GD
8ALF76		0.0197	-0.0014	-0.94	0.0214	-0.0014	-0.97	OE
8AWK8M		0.0223	0.0013	0.88	0.0243	0.0015	1.00	OE
8C7AZK		0.0196	-0.0014	-0.97	0.0221	-0.0008	-0.52	OE
8EUYVD		0.0230	0.0020	1.36	0.0255	0.0026	1.76	OE
8TW9YM		0.0233	0.0023	1.57	0.0216	-0.0013	-0.86	IC
8XPCNK	X	0.0187	-0.0024	-1.63	0.0187	-0.0042	-2.85	OE
8ZBDK6		0.0217	0.0006	0.42	0.0233	0.0005	0.32	OE
9C4UA7		0.0231	0.0021	1.41	0.0256	0.0027	1.86	OE
9U3DPF		0.0201	-0.0009	-0.65	0.0222	-0.0007	-0.46	AE
9YGUAQ		0.0201	-0.0009	-0.63	0.0223	-0.0006	-0.41	OE
9ZBF4H		0.0218	0.0008	0.52	0.0213	-0.0015	-1.04	OE
A3ADQF		0.0213	0.0003	0.20	0.0267	0.0038	2.58	OE
AAV8ZL		0.0227	0.0016	1.11	0.0240	0.0011	0.77	OE
AJH6UK		0.0214	0.0004	0.24	0.0232	0.0003	0.20	OE
ATMD7Q		0.0214	0.0003	0.22	0.0235	0.0007	0.45	OE
BQELJG		0.0210	0.0000	-0.03	0.0220	-0.0009	-0.59	OE
BUDWFF	*	0.0230	0.0020	1.34	0.0230	0.0001	0.09	OE
C6A2FG		0.0207	-0.0004	-0.26	0.0222	-0.0006	-0.43	OE
CBE463		0.0187	-0.0024	-1.63	0.0210	-0.0019	-1.27	OE
CJRUGZ		0.0210	-0.0001	-0.06	0.0235	0.0006	0.42	OE
CPXKHZ		0.0207	-0.0004	-0.26	0.0227	-0.0002	-0.14	OE
CTW4E7		0.0216	0.0005	0.36	0.0233	0.0004	0.27	OE
DA2VMG	*	0.0250	0.0040	2.71	0.0263	0.0035	2.35	OE
DKLZXM		0.0215	0.0005	0.33	0.0233	0.0004	0.27	OE
DKXXXA	X	0.0130	-0.0080	-5.51	0.0144	-0.0085	-5.78	OE
DMRKN8		0.0217	0.0006	0.42	0.0238	0.0009	0.61	OE
DQQYAC		0.0193	-0.0017	-1.18	0.0227	-0.0002	-0.14	OE
DTF2C4		0.0203	-0.0007	-0.49	0.0217	-0.0012	-0.82	IC
E6Z6QE		0.0177	-0.0033	-2.27	0.0196	-0.0033	-2.24	OE

Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 178

Chemical Analysis Element #9 - Carbon & Low Alloy Steel - Percent  
ALUMINUM (Al)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EBPJMM		0.0202	-0.0009	-0.60	0.0219	-0.0009	-0.63	AE
EFYZVC		0.0202	-0.0008	-0.56	0.0220	-0.0008	-0.57	XX
EMLPH8		0.0203	-0.0007	-0.51	0.0222	-0.0007	-0.48	OE
EVBGTQ		0.0206	-0.0004	-0.31	0.0228	-0.0001	-0.07	OE
EYCJRF		0.0228	0.0018	1.22	0.0241	0.0013	0.86	OE
EZQT2F		0.0213	0.0003	0.17	0.0235	0.0006	0.41	OE
FVTQJ7		0.0243	0.0033	2.25	0.0253	0.0025	1.67	GD
G8KWQA		0.0230	0.0020	1.34	0.0250	0.0021	1.45	DR
GLJL7F		0.0197	-0.0014	-0.95	0.0217	-0.0012	-0.82	OE
GUU42Y		0.0198	-0.0013	-0.88	0.0217	-0.0011	-0.77	OE
HV2LZV		0.0207	-0.0003	-0.22	0.0219	-0.0010	-0.68	IC
JF4URY		0.0213	0.0003	0.20	0.0223	-0.0005	-0.36	OE
JKYNPZ		0.0185	-0.0025	-1.75	0.0199	-0.0030	-2.01	OE
JM67NV		0.0236	0.0025	1.75	0.0249	0.0020	1.36	OE
JR3M3B		0.0200	-0.0010	-0.72	0.0220	-0.0009	-0.59	OE
JTCTD7		0.0217	0.0007	0.45	0.0225	-0.0003	-0.23	OE
K4RZPZ		0.0228	0.0018	1.22	0.0251	0.0022	1.52	OE
KLQZYK		0.0224	0.0014	0.95	0.0230	0.0001	0.07	OE
KM7DDU		0.0188	-0.0023	-1.56	0.0205	-0.0024	-1.63	OE
KRXP6K	X	0.0270	0.0060	4.08	0.0280	0.0051	3.48	XX
KWRJ68		0.0208	-0.0003	-0.19	0.0228	0.0000	-0.02	OE
LCGVJA		0.0227	0.0017	1.16	0.0245	0.0016	1.09	OE
LCW84Z		0.0220	0.0010	0.65	0.0237	0.0008	0.54	OE
M3RPUU		0.0202	-0.0008	-0.58	0.0217	-0.0011	-0.77	IC
MKN73X		0.0228	0.0018	1.22	0.0247	0.0019	1.27	OE
MUWJD2		0.0223	0.0013	0.88	0.0247	0.0018	1.22	OE
N4H4YX		0.0219	0.0009	0.58	0.0239	0.0010	0.68	XX
NBWWAU		0.0198	-0.0013	-0.88	0.0232	0.0003	0.20	OE
NFQ4EN		0.0238	0.0028	1.89	0.0254	0.0025	1.72	OE
NMUXMX		0.0203	-0.0007	-0.49	0.0227	-0.0002	-0.14	OE
NTVAHV		0.0182	-0.0028	-1.93	0.0203	-0.0026	-1.74	OE
NVNX6W		0.0207	-0.0003	-0.22	0.0236	0.0008	0.52	WD
P69Q2Z	X	0.0233	0.0022	1.52	0.0278	0.0049	3.33	OE
PAH4JY		0.0212	0.0001	0.07	0.0229	0.0000	0.02	OE
PHRE2B		0.0183	-0.0027	-1.86	0.0197	-0.0032	-2.17	AE
PHWPT3		0.0210	0.0000	-0.03	0.0230	0.0001	0.09	XX
PPD8DB		0.0197	-0.0014	-0.95	0.0220	-0.0009	-0.59	GD
PUMMMY		0.0193	-0.0017	-1.20	0.0219	-0.0010	-0.68	OE
Q4QWY6		0.0210	0.0000	-0.03	0.0240	0.0011	0.77	DR
QHN98A		0.0200	-0.0010	-0.72	0.0213	-0.0015	-1.04	OE
QPCV3E		0.0215	0.0005	0.31	0.0228	-0.0001	-0.05	OE
QU6RR7		0.0212	0.0001	0.08	0.0225	-0.0003	-0.24	OE
RYR2E9		0.0223	0.0012	0.84	0.0241	0.0013	0.86	OE
T9WAU9		0.0201	-0.0009	-0.62	0.0222	-0.0007	-0.46	OE
TFBGX4	*	0.0223	0.0013	0.88	0.0221	-0.0008	-0.52	OE
U9U6HH		0.0210	0.0000	-0.03	0.0230	0.0001	0.09	GD
U9VYDW		0.0205	-0.0006	-0.40	0.0229	0.0000	0.00	OE
UAQGEX		0.0187	-0.0024	-1.63	0.0197	-0.0032	-2.17	AE
UY3PNY		0.0216	0.0006	0.40	0.0226	-0.0003	-0.20	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 178

Chemical Analysis Element #9 - Carbon & Low Alloy Steel - Percent  
ALUMINUM (Al)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UZDQHX		0.0217	0.0006	0.42	0.0237	0.0008	0.54	OE
V9NB83		0.0202	-0.0008	-0.56	0.0233	0.0004	0.27	OE
VAKJJT	X	0.0231	0.0020	1.38	0.0279	0.0051	3.44	OE
VPF3LU		0.0233	0.0022	1.52	0.0260	0.0032	2.15	OE
VF7JVY		0.0208	-0.0002	-0.16	0.0231	0.0002	0.15	OE
VLYJDZ		0.0220	0.0010	0.65	0.0240	0.0011	0.77	OE
VPBQBY		0.0212	0.0002	0.10	0.0232	0.0003	0.23	OE
VYXN7J		0.0234	0.0023	1.59	0.0257	0.0028	1.90	OE
VZVYDU		0.0210	0.0000	-0.03	0.0230	0.0001	0.09	OE
WAVPJM	X	0.0194	-0.0016	-1.11	0.0319	0.0091	6.16	IC
WLA3B3		0.0210	0.0000	-0.03	0.0217	-0.0012	-0.82	OE
WUNL4N		0.0199	-0.0011	-0.76	0.0214	-0.0015	-1.00	OE
WYJDCK		0.0223	0.0013	0.88	0.0240	0.0011	0.77	OE
WZP48T		0.0200	-0.0010	-0.72	0.0220	-0.0009	-0.59	GD
X79QBX		0.0210	0.0000	-0.03	0.0220	-0.0009	-0.59	AE
XELLJ		0.0180	-0.0030	-2.07	0.0196	-0.0032	-2.20	OE
XRAHYP		0.0223	0.0012	0.84	0.0228	-0.0001	-0.07	XX
YQYZ6W		0.0200	-0.0010	-0.72	0.0213	-0.0015	-1.04	GD
ZD9LMF		0.0200	-0.0010	-0.72	0.0267	0.0038	2.58	IC
ZPXLEH		0.0237	0.0027	1.84	0.0251	0.0022	1.49	OE
ZRNQZP		0.0215	0.0005	0.31	0.0236	0.0008	0.52	OE
ZTV68V		0.0200	-0.0010	-0.72	0.0220	-0.0009	-0.59	IC
ZVM6AK		0.0208	-0.0002	-0.15	0.0220	-0.0009	-0.61	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.0210	Percent	0.0229	Percent
Std Dev Btwn Labs	0.0015	Percent	0.0015	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 109 of 121 reporting participants



Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 178  
Chemical Analysis Element #9 - Carbon & Low Alloy Steel - Percent  
ALUMINUM (Al)

**Comments on assigned Data Flags for Analysis #178**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>4VQ34R</b>	X	Data for sample L34 are high. Inconsistent in testing between samples.
<b>8XPCNK</b>	X	Data for sample L34 are low. Inconsistent in testing between samples. Inconsistent within the determinations of sample L34.
<b>DKXXXA</b>	X	Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of both samples.
<b>KRXP6K</b>	X	Data for both samples are high. Possible Systematic error.
<b>P69Q2Z</b>	X	Data for sample L34 are high. Inconsistent in testing between samples. Inconsistent within the determinations of sample L33.
<b>VAKJJT</b>	X	Data for sample L34 are high. Inconsistent in testing between samples. Inconsistent within the determinations of sample L33.
<b>WAVPJM</b>	X	Data for sample L34 are high. Inconsistent in testing between samples.

Cycle 113  
1st Q, 2016

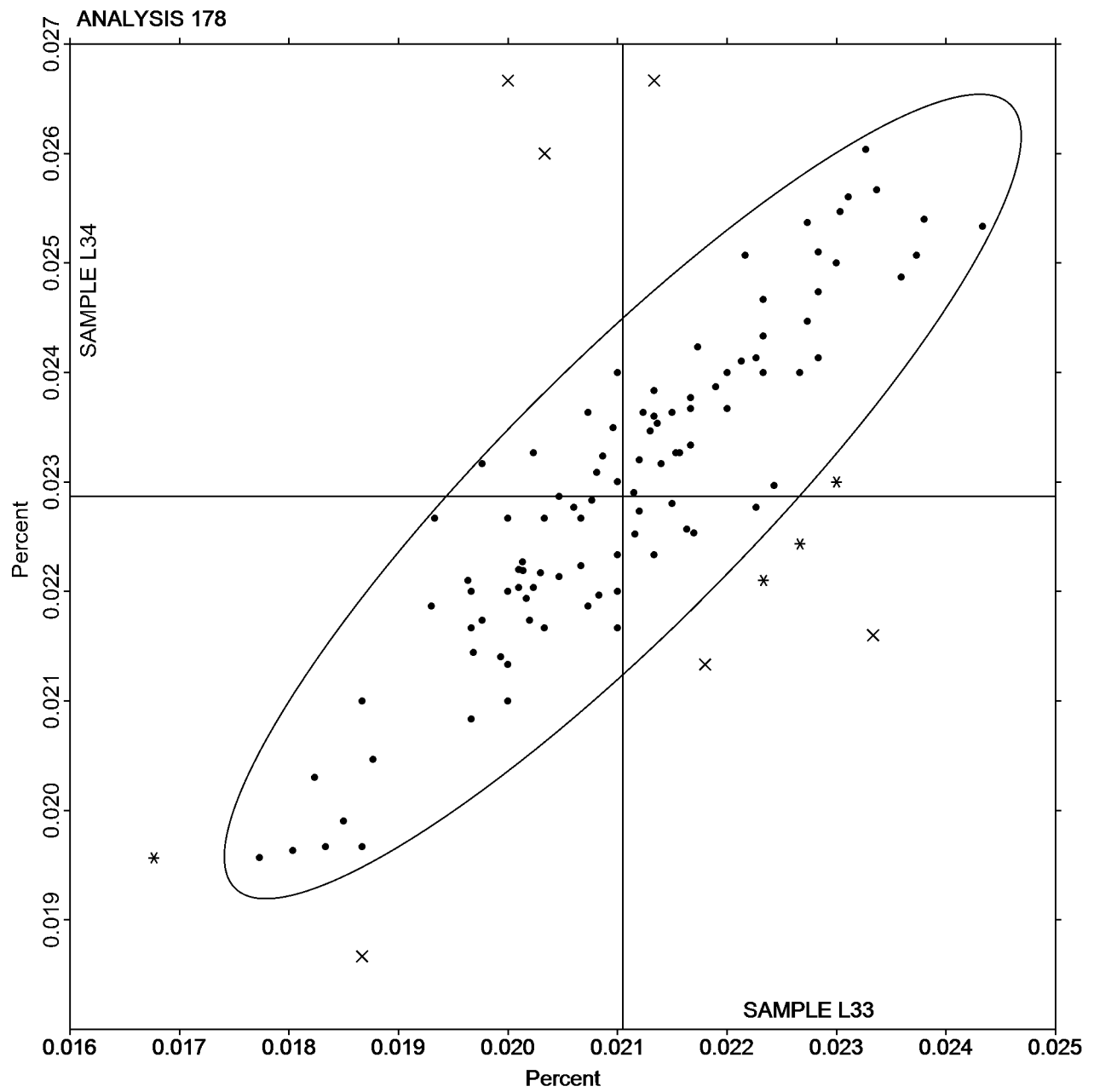
### Interlaboratory Testing Program for Metals

#### Analysis 178

Chemical Analysis Element #9 - Carbon & Low Alloy Steel - Percent  
ALUMINUM (Al)

SAMPLE L33  
0.0210 Percent

SAMPLE L34  
0.0229 Percent



Cycle 113

1st Q, 2016

## Interlaboratory Testing Program for Metals

## Analysis 179

Chemical Analysis Element #10 - Carbon & Low Alloy Steel - Percent  
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23GRKH		0.2267	0.0023	0.43	0.4070	-0.0036	-0.40	IC
2BTRET		0.2248	0.0004	0.07	0.4093	-0.0013	-0.14	OE
2F36WR		0.2260	0.0016	0.31	0.4137	0.0031	0.34	XX
38PFVX		0.2253	0.0009	0.18	0.4133	0.0027	0.30	OE
3CZJGL		0.2127	-0.0117	-2.22	0.4010	-0.0096	-1.05	AE
3UZGXV		0.2273	0.0029	0.56	0.4000	-0.0106	-1.16	OE
4M289H		0.2273	0.0029	0.55	0.4013	-0.0094	-1.02	OE
4NAJNY		0.2237	-0.0007	-0.14	0.4067	-0.0040	-0.43	OE
4VQ34R		0.2186	-0.0058	-1.10	0.4179	0.0073	0.79	OE
4WMBFH		0.2366	0.0122	2.31	0.4199	0.0093	1.02	OE
4YTYJY		0.2200	-0.0044	-0.83	0.3913	-0.0193	-2.11	OE
66DAEE		0.2210	-0.0034	-0.64	0.4057	-0.0050	-0.54	GD
6GVUYB		0.2200	-0.0044	-0.83	0.4200	0.0094	1.02	OE
6V7LNP		0.2243	-0.0001	-0.01	0.4223	0.0117	1.28	OE
6XFP7R		0.2247	0.0003	0.05	0.4120	0.0014	0.15	OE
736KPB		0.2250	0.0006	0.12	0.4110	0.0004	0.04	OE
78VWHL		0.2241	-0.0003	-0.05	0.4031	-0.0076	-0.83	OE
7MA7CP		0.2266	0.0022	0.42	0.4132	0.0025	0.28	IC
87L8PP	X	0.6833	0.4589	87.01	0.4017	-0.0090	-0.98	XX
89PW44	*	0.2247	0.0003	0.05	0.3910	-0.0196	-2.14	GD
8ALF76		0.2160	-0.0084	-1.60	0.4045	-0.0061	-0.67	OE
8C7AZK		0.2150	-0.0094	-1.78	0.4013	-0.0093	-1.02	OE
8EUYVD		0.2266	0.0022	0.43	0.4045	-0.0062	-0.67	OE
8TW9YM		0.2330	0.0086	1.63	0.4223	0.0117	1.28	IC
8XPCNK	X	0.2100	-0.0144	-2.73	0.3700	-0.0406	-4.44	CL
8ZBDK6		0.2220	-0.0024	-0.45	0.4097	-0.0010	-0.11	OE
9C4UA7		0.2232	-0.0012	-0.22	0.4146	0.0040	0.43	OE
9U3DPF		0.2282	0.0038	0.72	0.4193	0.0087	0.95	AE
9YGUAQ		0.2212	-0.0032	-0.61	0.4095	-0.0012	-0.13	OE
9ZBF4H		0.2200	-0.0044	-0.83	0.4093	-0.0013	-0.14	OE
AAV8ZL	X	0.2440	0.0196	3.72	0.4653	0.0547	5.98	OE
AJH6UK		0.2252	0.0008	0.15	0.4116	0.0009	0.10	OE
ATMD7Q		0.2197	-0.0047	-0.89	0.4047	-0.0060	-0.65	OE
BQELJG		0.2277	0.0033	0.62	0.4123	0.0017	0.19	OE
BUDWFF		0.2180	-0.0064	-1.21	0.4170	0.0064	0.70	OE
C6A2FG		0.2195	-0.0049	-0.93	0.4060	-0.0046	-0.51	OE
CBE463		0.2207	-0.0037	-0.70	0.4087	-0.0020	-0.21	OE
CJRUZG	*	0.2371	0.0127	2.41	0.4352	0.0245	2.68	OE
CPXKHZ		0.2208	-0.0036	-0.69	0.4082	-0.0024	-0.26	OE
CTW4E7		0.2238	-0.0006	-0.11	0.4148	0.0041	0.45	OE
DA2VMG	X	0.2407	0.0163	3.09	0.4167	0.0060	0.66	OE
DKLZXM		0.2220	-0.0024	-0.45	0.4173	0.0067	0.73	OE
DKXXXA		0.2252	0.0008	0.15	0.4108	0.0002	0.02	OE
DMRKN8		0.2193	-0.0051	-0.97	0.4074	-0.0033	-0.36	OE
DQQYAC		0.2277	0.0033	0.62	0.4160	0.0054	0.59	OE
DTF2C4		0.2357	0.0113	2.14	0.4300	0.0194	2.12	IC
E3VH94		0.2257	0.0013	0.24	0.4173	0.0067	0.73	XX
E6Z6QE		0.2293	0.0049	0.94	0.4227	0.0120	1.31	OE
EBPJMM		0.2157	-0.0087	-1.65	0.4004	-0.0103	-1.12	AE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 179

Chemical Analysis Element #10 - Carbon & Low Alloy Steel - Percent  
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
EFYZVC		0.2230	-0.0014	-0.26	0.4100	-0.0006	-0.07	XX
EMLPH8		0.2209	-0.0035	-0.65	0.4093	-0.0013	-0.14	OE
EVBGTQ		0.2262	0.0018	0.34	0.4108	0.0002	0.02	OE
EYCJRF		0.2217	-0.0027	-0.52	0.4180	0.0074	0.80	OE
FVTQJ7		0.2350	0.0106	2.01	0.4187	0.0080	0.88	GD
G8KWQA		0.2270	0.0026	0.50	0.4217	0.0110	1.21	DR
GLJL7F		0.2163	-0.0081	-1.53	0.3900	-0.0206	-2.25	OE
GUU42Y		0.2283	0.0039	0.74	0.4291	0.0185	2.02	OE
HV2LZV		0.2150	-0.0094	-1.78	0.4107	0.0000	0.00	WD
JF4URY		0.2203	-0.0041	-0.77	0.4047	-0.0060	-0.65	OE
JKYNPZ	*	0.2167	-0.0077	-1.46	0.3830	-0.0276	-3.02	OE
JM67NV		0.2244	0.0000	0.01	0.4034	-0.0073	-0.79	OE
JR3M3B		0.2263	0.0019	0.37	0.4097	-0.0010	-0.11	OE
JTCTD7		0.2293	0.0049	0.94	0.4090	-0.0016	-0.18	OE
K4RZPZ		0.2288	0.0044	0.84	0.4057	-0.0050	-0.54	OE
KLQZYK		0.2227	-0.0017	-0.33	0.4123	0.0017	0.19	OE
KM7DDU		0.2230	-0.0014	-0.26	0.4120	0.0014	0.15	OE
KRXP6K	X	0.2330	0.0086	1.63	0.4500	0.0394	4.30	XX
KWRJ68		0.2225	-0.0019	-0.36	0.4102	-0.0004	-0.04	OE
LCGVJA		0.2274	0.0030	0.58	0.4089	-0.0017	-0.19	OE
LCW84Z		0.2303	0.0059	1.13	0.4140	0.0034	0.37	OE
M3RPUU		0.2240	-0.0004	-0.07	0.4117	0.0010	0.11	IC
MKN73X	X	0.2420	0.0176	3.34	0.4467	0.0360	3.94	OE
MUWJD2	*	0.2110	-0.0134	-2.54	0.3917	-0.0190	-2.07	OE
N4H4YX		0.2213	-0.0031	-0.58	0.4088	-0.0019	-0.20	OE
NBWWAU		0.2208	-0.0036	-0.69	0.4166	0.0059	0.65	OE
NFQ4EN		0.2204	-0.0040	-0.76	0.4097	-0.0009	-0.10	OE
NMUXMX		0.2297	0.0053	1.00	0.4237	0.0130	1.42	OE
NTVAHV		0.2330	0.0086	1.63	0.4270	0.0164	1.79	OE
NVNX6W		0.2247	0.0003	0.05	0.4110	0.0004	0.04	WD
P69Q2Z		0.2300	0.0056	1.06	0.4167	0.0060	0.66	OE
PAH4JY		0.2224	-0.0019	-0.37	0.4094	-0.0012	-0.14	OE
PHRE2B		0.2223	-0.0021	-0.39	0.4080	-0.0026	-0.29	AE
PHWPT3	X	0.1710	-0.0534	-10.12	0.3740	-0.0366	-4.00	XX
PPD8DB		0.2283	0.0039	0.75	0.4250	0.0144	1.57	GD
PUMMMY		0.2301	0.0057	1.08	0.4217	0.0110	1.21	OE
Q4QWY6		0.2227	-0.0017	-0.33	0.4067	-0.0040	-0.43	DR
Q9ZFNB		0.2232	-0.0012	-0.22	0.4155	0.0049	0.54	XX
QHN98A		0.2247	0.0003	0.05	0.4123	0.0017	0.19	OE
QPCV3E		0.2226	-0.0018	-0.34	0.4122	0.0016	0.17	OE
QU6RR7	X	0.2486	0.0242	4.60	0.4330	0.0224	2.45	OE
RYR2E9		0.2220	-0.0024	-0.45	0.4120	0.0014	0.15	OE
RYVHLT		0.2283	0.0039	0.75	0.4080	-0.0026	-0.29	DR
T9WUAU9		0.2265	0.0022	0.41	0.4094	-0.0013	-0.14	OE
TFBGX4		0.2242	-0.0002	-0.03	0.4105	-0.0002	-0.02	OE
U9U6HH		0.2300	0.0056	1.06	0.4167	0.0060	0.66	GD
U9VYDW		0.2213	-0.0031	-0.58	0.4065	-0.0042	-0.45	OE
UAQGEX		0.2227	-0.0017	-0.33	0.4080	-0.0026	-0.29	AE
UY3PNY		0.2373	0.0129	2.45	0.4220	0.0114	1.24	OE

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals

Analysis 179

Chemical Analysis Element #10 - Carbon & Low Alloy Steel - Percent  
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample L33			Sample L34			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
UZDQHX		0.2203	-0.0041	-0.77	0.4103	-0.0003	-0.03	OE
V9NB83		0.2289	0.0045	0.86	0.4026	-0.0080	-0.87	OE
VAKJJT		0.2300	0.0056	1.06	0.4167	0.0060	0.66	OE
VBF3LU		0.2260	0.0016	0.31	0.4100	-0.0006	-0.07	OE
VF7JVY		0.2184	-0.0060	-1.14	0.3989	-0.0118	-1.28	OE
VPBQBY		0.2330	0.0086	1.63	0.4080	-0.0026	-0.29	OE
VYXN7J		0.2237	-0.0007	-0.14	0.4103	-0.0003	-0.03	OE
VZVYDU		0.2317	0.0073	1.38	0.4197	0.0090	0.99	XX
WAVPJM		0.2237	-0.0007	-0.14	0.4060	-0.0046	-0.51	OE
WLA3B3		0.2180	-0.0064	-1.21	0.4020	-0.0086	-0.94	OE
WRH6P6		0.2212	-0.0032	-0.61	0.4024	-0.0082	-0.90	WD
WUNL4N		0.2227	-0.0017	-0.33	0.4070	-0.0036	-0.40	OE
WYJDCK		0.2200	-0.0044	-0.83	0.4000	-0.0106	-1.16	OE
WZP48T	*	0.2180	-0.0064	-1.21	0.3863	-0.0243	-2.65	GD
X79QBX		0.2323	0.0079	1.51	0.4103	-0.0003	-0.03	AE
XELLLJ		0.2280	0.0036	0.69	0.4273	0.0167	1.82	OE
XRAHYP		0.2133	-0.0111	-2.10	0.4000	-0.0106	-1.16	XX
Y7P7AK		0.2343	0.0099	1.89	0.4233	0.0127	1.39	OE
YQYZ6W		0.2270	0.0026	0.50	0.4240	0.0134	1.46	GD
YW38KZ	*	0.2197	-0.0047	-0.89	0.3857	-0.0250	-2.73	OE
ZD9LMF		0.2203	-0.0041	-0.77	0.4073	-0.0033	-0.36	IC
ZPXLEH		0.2297	0.0053	1.00	0.4193	0.0087	0.95	OE
ZRNQZP	X	0.2257	0.0013	0.24	0.4500	0.0394	4.30	OE
ZTV68V		0.2300	0.0056	1.06	0.4153	0.0047	0.51	IC
ZVM6AK		0.2237	-0.0007	-0.14	0.4123	0.0017	0.19	IC

Summary Statistics

	Sample L33		Sample L34	
Grand Means	0.2244	Percent	0.4106	Percent
Std Dev Btwn Labs	0.0053	Percent	0.0092	Percent

Samples L33 , L34 : AISI 8740

Statistics based on 114 of 123 reporting participants

Cycle 113  
1st Q, 2016

Interlaboratory Testing Program for Metals  
Analysis 179  
Chemical Analysis Element #10 - Carbon & Low Alloy Steel - Percent  
MOLYBDENUM (Mo)

**Comments on assigned Data Flags for Analysis #179**

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
<b>87L8PP</b>	X	Data for sample L33 are high.
<b>8XPCNK</b>	X	Data for sample L34 are low.
<b>AAV8ZL</b>	X	Data for both samples are high.
<b>DA2VMG</b>	X	Data for sample L33 are high.
<b>KRXP6K</b>	X	Data for sample L34 are high.
<b>MKN73X</b>	X	Data for both samples are high.
<b>PHWPT3</b>	X	Data for both samples are low.
<b>QU6RR7</b>	X	Data for sample L33 are high.
<b>ZRNQZP</b>	X	Data for sample L34 are high. Inconsistent within the determinations of sample L34.

Cycle 113  
1st Q, 2016

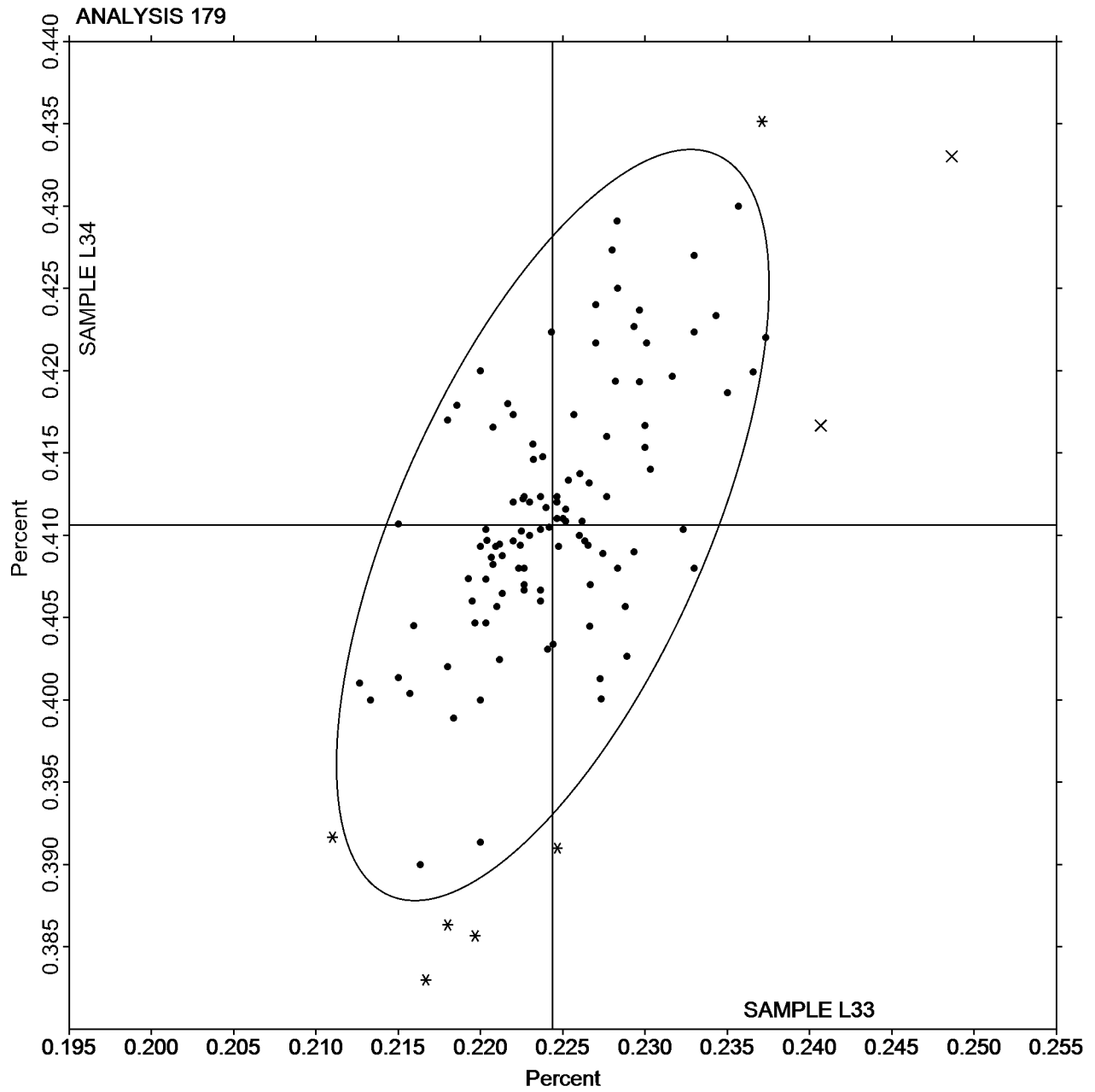
### Interlaboratory Testing Program for Metals

#### Analysis 179

Chemical Analysis Element #10 - Carbon & Low Alloy Steel - Percent  
MOLYBDENUM (Mo)

SAMPLE L33  
0.2244 Percent

SAMPLE L34  
0.4106 Percent



## Instrument and Method Code List - Cycle 113

Instrument and Method information as provided by laboratories

Instruments are no longer tracked for analyses 105-148

### 170: Carbon & Low Alloy Steel, Element #1 - CARBON (C)

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
CI	Combustion / IR
CO	Combustion
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

### 171: Carbon & Low Alloy Steel, Element #2 - MANGANESE (Mn)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

### 172: Carbon & Low Alloy Steel, Element #3 - PHOSPHORUS (P)

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
CL	Colorimetry
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element



#### 173: Carbon & Low Alloy Steel, Element #4 - SULFUR (S)

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
CI	Combustion / IR
CO	Combustion
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

#### 174: Carbon & Low Alloy Steel, Element #5 - SILICON (Si)

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
GR	Gravimetry
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

#### 175: Carbon & Low Alloy Steel, Element #6 - COPPER (Cu)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

**176: Carbon & Low Alloy Steel, Element #7 - NICKEL (Ni)**

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

**177: Carbon & Low Alloy Steel, Element #8 - CHROMIUM (Cr)**

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

**178: Carbon & Low Alloy Steel, Element #9 - ALUMINIUM (Al)**

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

179: Carbon & Low Alloy Steel, Element #10 - MOLYBDENUM (Mo)

<u>Method Code</u>	<u>Description</u>
AE	Spectrometry - Atomic Emission (AES)
CL	Colorimetry
DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XX	Please Indicate Method Used for Current Element

## Key for Fasteners & Metals Program Web Summary Report

- WebCode** - Assigned laboratory identification number(temporary)used to ensure lab confidentiality while permitting a lab to locate its data in the report published on the CTS website.
  
- Lab Mean** - The average of the test results obtained by the participant.
  
- Grand Mean** - The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.
  
- Between-Lab Standard Deviation** - An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).
  
- Comparative Performance Value (CPV)** - An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN.  $CPV = (LAB\ MEAN - GRAND\ MEAN) / BETWEEN-LAB\ STANDARD\ DEVIATION$ . The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa).
  
- Instr. Code** - A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).
  
- Data Flag** - DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

### Data Flags

Data Flag Type	Statistically Included/Excluded	ACTION REQUIRED
*	INCLUDED	<b>CAUTION</b> - review testing procedure and monitor future results. Results fall outside the drawn 95% ellipse but within a 99% ellipse that is calculated but not drawn. Labs flagged with an * do not typically receive a specific note regarding the flag. If this error is repeated in future rounds, however, a lab may need to stop and review its testing procedures. The initial data flag is not cause for alarm.
X	EXCLUDED	<b>STOP</b> - immediate review of data and/or testing procedure is required (all tests except Chemical Analyses). Results fall outside the 99% ellipse. See the specific note following the data for more information on why the data are excluded. For Chemical Analyses see an additional Memo.
M	EXCLUDED	<b>PROCEED</b> - lab was unable to report data for at least one sample. However, a lab receiving two or more M flags for a test may need to stop and review its testing procedures.

**Graph** - For each laboratory, the Lab Mean for the second sample (y-axis) is plotted against the Lab Mean for the first sample (x-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the Grand Means for each sample. When 20 or more laboratories are included in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained above. Labs not receiving a data flag appear as points on the plot.