



Fasteners & Metals Testing Program

Summary Report Cycle 112, 4th Quarter - 2015

Collaborative Testing Services, Inc.

[About the Metals Program](#) [About CTS](#) [Key to Tables and Graphs](#) [Instrument and Method Code List](#)

<u>Analysis</u>	<u>Test Group</u>
------------------------	--------------------------

Tensile Tests	
----------------------	--

130	Tensile Strength (Flat Steel)
131	Yield Strength (Flat Steel)
132	Elongation (Flat Steel)

Fasteners Tests	
------------------------	--

115	Fastener Wedge Tensile (10 degree)
116	Fastener Axial Tensile
125	Rockwell Hardness of Fasteners
126	Vickers Hardness
127	Fastener Wedge Tensile (10 deg) Metric
128	Fastener Axial Tensile - Metric
129	Fastener Double Shear

Hardness / Metallography Tests	
---------------------------------------	--

120	Rockwell Hardness (C Scale)
136	Rockwell Superficial Hardness (30N Scale)
145	Total Case Depth
146	Effective Case Depth
148	Grain Size (Inconel)

Chemical Analyses	
--------------------------	--

160 - 167	Chemical Analysis: Copper-based Alloy
180 - 189	Chemical Analysis: Corrosion Resistant Steel

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.

For further information contact:

COLLABORATIVE TESTING SERVICES, INC.
21331 Gentry Drive
Sterling, VA 20166

Phone: (571) 434-1925
FAX: (571)434-1937
e-mail: metals@cts-interlab.com
www.collaborativetesting.com
Office Hours: 8:00 a.m. - 4:30 p.m. ET

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 115

Fastener Wedge Tensile (10 deg) - ksi
ASTM F606

WebCode	Data Flag	Sample X31			Sample X32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2DYC3Q		168.97	-0.84	-0.56	169.55	-0.81	-0.47	ZZ
322YWQ		171.69	1.87	1.24	170.75	0.38	0.22	ZZ
392YRL		169.68	-0.13	-0.09	170.36	-0.01	0.00	ZZ
39YK8Y		167.53	-2.28	-1.51	168.97	-1.40	-0.81	ZZ
3NDNVE		171.00	1.19	0.79	170.42	0.06	0.03	ZZ
4QFVNR		170.82	1.00	0.66	170.87	0.50	0.29	ZZ
68H33J		169.71	-0.10	-0.07	169.14	-1.22	-0.70	ZZ
7HF77D		168.60	-1.21	-0.80	169.68	-0.69	-0.40	ZZ
7MRD7W		170.50	0.69	0.46	170.89	0.53	0.31	ZZ
87X7MP	X	13,687	13,516.85	8,941.4	13,127	12,956.30	7,473.8	ZZ
8BQC4D		171.37	1.55	1.03	173.13	2.77	1.60	ZZ
8PW2M9		167.20	-2.62	-1.73	168.57	-1.79	-1.03	ZZ
9XG27P		172.02	2.21	1.46	171.54	1.18	0.68	ZZ
A48LWC		169.91	0.10	0.07	172.28	1.92	1.11	ZZ
ACTWW6		169.29	-0.52	-0.35	171.57	1.21	0.70	ZZ
AFJTVW		167.23	-2.58	-1.71	167.67	-2.70	-1.56	ZZ
AMV6NN		171.08	1.27	0.84	171.21	0.85	0.49	ZZ
APKKUP		169.31	-0.50	-0.33	171.97	1.61	0.93	ZZ
AW78AP		171.10	1.28	0.85	174.19	3.83	2.21	ZZ
B34L9V		168.57	-1.25	-0.82	170.13	-0.23	-0.13	ZZ
B38VfV		170.48	0.66	0.44	169.67	-0.70	-0.40	ZZ
C3Z32K	X	8.633	-161.18	-106.62	8.640	-161.72	-93.29	ZZ
C6RA83		167.43	-2.38	-1.57	169.03	-1.33	-0.77	ZZ
CK7H7K	*	166.90	-2.91	-1.93	165.97	-4.40	-2.54	ZZ
CWY2MC	X	118.36	-51.46	-34.04	118.96	-51.40	-29.65	ZZ
D6LE22		168.71	-1.10	-0.73	170.10	-0.27	-0.15	ZZ
DNEANX		170.67	0.85	0.56	171.83	1.47	0.85	ZZ
EJJTYA		167.67	-2.15	-1.42	168.33	-2.03	-1.17	ZZ
ENAA23		173.20	3.39	2.24	172.70	2.34	1.35	ZZ
EVWTV4		169.13	-0.68	-0.45	169.73	-0.63	-0.36	ZZ
EVZDJ7		171.60	1.79	1.18	170.37	0.00	0.00	ZZ
EWBDF2		169.93	0.12	0.08	170.67	0.30	0.17	ZZ
EX2JWR		169.73	-0.08	-0.05	171.30	0.94	0.54	ZZ
FBMBX7		173.20	3.39	2.24	172.08	1.72	0.99	ZZ
FYAZKP		168.60	-1.21	-0.80	169.17	-1.20	-0.69	ZZ
G9BXTA		170.40	0.59	0.39	170.17	-0.20	-0.11	ZZ
GFAA2Z		168.90	-0.91	-0.60	169.43	-0.93	-0.54	ZZ
GJ9X7E		171.10	1.29	0.85	171.93	1.57	0.91	ZZ
HEGQN7		168.71	-1.10	-0.73	170.60	0.24	0.14	ZZ
HQADU2		171.73	1.92	1.27	169.50	-0.86	-0.50	ZZ
J32FBZ	X	170.30	0.49	0.32	152.40	-17.96	-10.36	ZZ
JWPHTE		168.67	-1.15	-0.76	171.67	1.30	0.75	ZZ
LARLEK		168.46	-1.36	-0.90	168.72	-1.64	-0.95	ZZ
LH33QR		170.63	0.82	0.54	171.47	1.10	0.64	ZZ
M8LH7V	*	172.90	3.09	2.04	168.50	-1.86	-1.08	ZZ
MFGK97		168.67	-1.15	-0.76	167.97	-2.40	-1.38	ZZ
MQRV6D		168.73	-1.09	-0.72	169.41	-0.96	-0.55	ZZ
NXP3UV		169.13	-0.68	-0.45	170.47	0.10	0.06	ZZ
QHRTM9	X	171.22	1.40	0.93	179.19	8.83	5.09	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 115

Fastener Wedge Tensile (10 deg) - ksi
ASTM F606

WebCode	Data Flag	Sample X31			Sample X32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QUJCD8		168.10	-1.71	-1.13	172.70	2.34	1.35	ZZ
QZAX8E		168.50	-1.31	-0.87	166.60	-3.76	-2.17	ZZ
RB642D		171.49	1.68	1.11	168.51	-1.86	-1.07	ZZ
RP488P	*	167.10	-2.71	-1.80	165.33	-5.03	-2.90	ZZ
RQX3JZ		170.33	0.52	0.34	171.77	1.40	0.81	ZZ
RV843H		170.90	1.09	0.72	168.97	-1.39	-0.80	ZZ
T34H4A		170.73	0.92	0.61	170.36	-0.01	0.00	ZZ
TEYTAV	X	173.96	4.14	2.74	176.24	5.88	3.39	ZZ
TG73P8		171.57	1.75	1.16	169.50	-0.86	-0.50	ZZ
U4C3BB		169.57	-0.25	-0.16	170.23	-0.13	-0.08	ZZ
U97YXF		170.61	0.80	0.53	170.66	0.30	0.17	ZZ
UV47VJ		170.92	1.11	0.73	170.93	0.57	0.33	ZZ
VDGAQA		168.83	-0.98	-0.65	169.90	-0.46	-0.27	ZZ
VTQACY		170.17	0.35	0.23	170.23	-0.13	-0.08	ZZ
W8998R		170.31	0.50	0.33	171.08	0.72	0.41	ZZ
WKWBPJ		167.96	-1.86	-1.23	171.61	1.25	0.72	ZZ
WWN7EY		169.85	0.04	0.02	170.79	0.42	0.24	ZZ
WZ7YYE		171.69	1.88	1.24	173.18	2.82	1.62	ZZ
XUY2GK		169.70	-0.12	-0.08	170.47	0.11	0.06	ZZ
YR7J26		169.38	-0.43	-0.28	173.52	3.15	1.82	ZZ
ZLWHHM		169.49	-0.32	-0.21	173.27	2.91	1.68	ZZ

Summary Statistics

	<u>Sample X31</u>		<u>Sample X32</u>	
Grand Means	169.81	ksi	170.36	ksi
Std Dev Btwn Labs	1.51	ksi	1.73	ksi

Samples X31 , X32 : Fastener sizes: 3/8-16 x 2, 3/8-16 x 2 3/4

Statistics based on 64 of 70 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 115

Fastener Wedge Tensile (10 deg) - ksi
ASTM F606

Comments on assigned Data Flags for Analysis #115

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
87X7MP	X	Extreme Data.
C3Z32K	X	Data for both samples are low.
CWY2MC	X	Data for both samples are low.
J32FBZ	X	Data for sample X32 are low.
QHRTM9	X	Data for sample X32 are high.
TEYTAV	X	Data for both samples are high.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 115

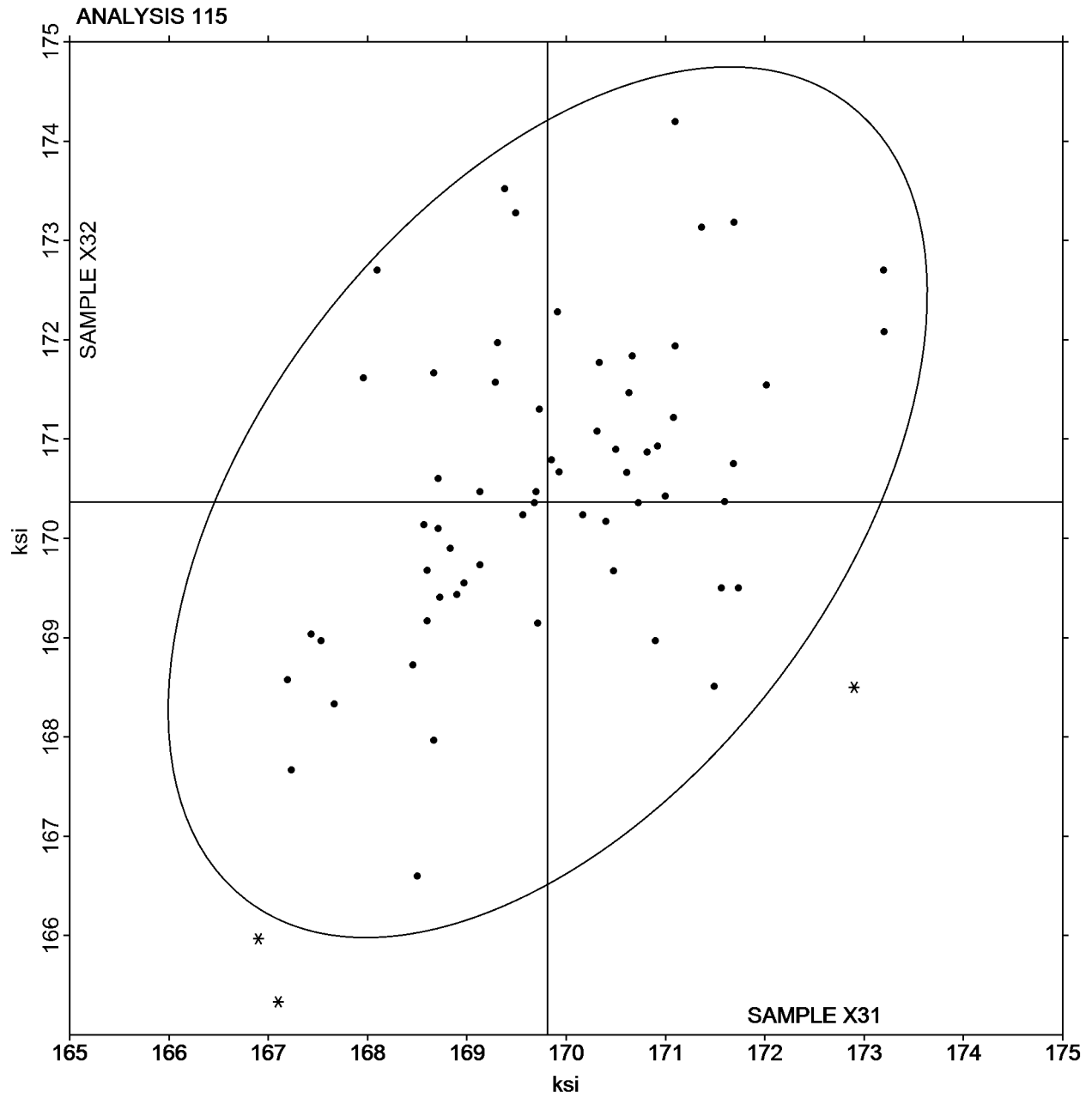
Fastener Wedge Tensile (10 deg) - ksi
ASTM F606

SAMPLE X31

169.81 ksi

SAMPLE X32

170.36 ksi



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 116

Fastener Axial Tensile - ksi
ASTM F606

WebCode	Data Flag	Sample Q31			Sample Q32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2DYC3Q		168.19	-1.47	-1.04	168.59	-2.74	-1.46	ZZ
2Z8U3R		170.20	0.54	0.38	173.75	2.42	1.29	ZZ
322YWQ		172.23	2.58	1.82	174.22	2.88	1.54	ZZ
392YRL		170.23	0.57	0.40	175.11	3.78	2.01	ZZ
3NDNVE		172.26	2.60	1.84	169.55	-1.78	-0.95	ZZ
3PMM2G		170.67	1.01	0.71	173.33	2.00	1.07	ZZ
3RBEQT		171.02	1.36	0.96	170.35	-0.98	-0.52	ZZ
4NB86V		171.47	1.81	1.28	171.14	-0.20	-0.10	ZZ
4QFVNR		168.88	-0.77	-0.55	172.85	1.52	0.81	ZZ
68H33J		168.95	-0.70	-0.50	168.58	-2.76	-1.47	ZZ
6A34X7		168.27	-1.39	-0.98	171.50	0.17	0.09	ZZ
6LZXHF	X	123.63	-46.03	-32.50	123.42	-47.91	-25.53	ZZ
7HF77D		167.87	-1.78	-1.26	169.21	-2.12	-1.13	ZZ
7MRD7W		172.10	2.44	1.72	174.64	3.31	1.76	ZZ
7U8WPW		169.30	-0.36	-0.25	170.27	-1.06	-0.57	ZZ
87X7MP	X	13,440	13,270.34	9,369.6	13,567	13,395.34	7,137.2	ZZ
8NVEGU	X	173.19	3.54	2.50	177.09	5.75	3.07	ZZ
9BMUX2		169.84	0.19	0.13	172.22	0.89	0.48	ZZ
9XG27P		170.78	1.13	0.80	170.54	-0.79	-0.42	ZZ
A48LWC		169.05	-0.60	-0.43	173.57	2.24	1.19	ZZ
ACTWW6		167.53	-2.13	-1.50	173.98	2.65	1.41	ZZ
AFJTVW		168.17	-1.49	-1.05	172.23	0.90	0.48	ZZ
AMV6NN		169.09	-0.57	-0.40	172.15	0.82	0.43	ZZ
AUX73W		168.20	-1.45	-1.03	172.71	1.38	0.74	ZZ
AW78AP		171.58	1.93	1.36	170.66	-0.67	-0.36	ZZ
B34L9V		168.70	-0.96	-0.68	170.07	-1.26	-0.67	ZZ
C3Z32K	X	8.715	-160.94	-113.63	8.687	-162.64	-86.66	ZZ
C4WUV6		170.08	0.43	0.30	171.09	-0.24	-0.13	ZZ
C6RA83		167.97	-1.69	-1.19	172.33	1.00	0.53	ZZ
CK7H7K		168.80	-0.86	-0.60	170.73	-0.60	-0.32	ZZ
CNJ8LN		170.20	0.54	0.38	170.10	-1.23	-0.66	ZZ
CWY2MC	X	116.85	-52.81	-37.29	117.45	-53.88	-28.71	ZZ
D3YPRW		169.60	-0.06	-0.04	173.53	2.20	1.17	ZZ
D6LE22		168.90	-0.75	-0.53	169.28	-2.05	-1.09	ZZ
DNEANX		171.07	1.41	1.00	171.60	0.27	0.14	ZZ
EJJTYA		168.67	-0.99	-0.70	168.00	-3.33	-1.78	ZZ
EVWTV4		169.90	0.24	0.17	173.30	1.97	1.05	ZZ
EVZDJ7		169.70	0.04	0.03	171.73	0.40	0.21	ZZ
EWBDF2		169.80	0.14	0.10	171.17	-0.16	-0.09	ZZ
EX2JWR		172.03	2.38	1.68	172.73	1.40	0.75	ZZ
F6XXWJ		168.33	-1.32	-0.93	168.83	-2.50	-1.33	ZZ
FBMBX7	X	174.74	5.08	3.59	174.86	3.53	1.88	ZZ
FJZ7Y8		169.23	-0.42	-0.30	170.70	-0.63	-0.34	ZZ
FUE9CR		167.87	-1.78	-1.26	172.35	1.02	0.54	ZZ
FXG67T		166.63	-3.02	-2.13	170.43	-0.90	-0.48	ZZ
FYAZKP		170.30	0.64	0.45	172.23	0.90	0.48	ZZ
FZ4QNH		170.65	1.00	0.70	172.20	0.87	0.46	ZZ
G4HZ3X	X	182.85	13.19	9.31	181.91	10.57	5.63	ZZ
G9BXTA		169.67	0.01	0.01	171.70	0.37	0.20	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 116

Fastener Axial Tensile - ksi
ASTM F606

WebCode	Data Flag	Sample Q31			Sample Q32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
GFAA2Z		169.40	-0.26	-0.18	169.13	-2.20	-1.17	ZZ
GK3DTJ		170.04	0.39	0.27	170.42	-0.91	-0.49	ZZ
HEGQN7		169.40	-0.26	-0.18	172.97	1.64	0.87	ZZ
HZCRDE		169.99	0.34	0.24	175.56	4.23	2.25	ZZ
JC4QUH		169.76	0.10	0.07	170.81	-0.52	-0.28	ZZ
JWPHTE		169.67	0.01	0.01	172.33	1.00	0.53	ZZ
JWTXAL		170.13	0.48	0.34	168.00	-3.33	-1.78	ZZ
L6FPNP	X	195.09	25.43	17.96	172.62	1.29	0.69	ZZ
L6V7GX		169.73	0.07	0.05	168.86	-2.47	-1.32	ZZ
LT7ZY2		172.24	2.58	1.83	171.48	0.15	0.08	ZZ
LYA9TA		170.00	0.34	0.24	171.00	-0.33	-0.18	ZZ
M2W3CW		169.89	0.24	0.17	172.47	1.14	0.61	ZZ
M7J2GB		169.74	0.09	0.06	172.89	1.55	0.83	ZZ
MFGK97		170.40	0.74	0.53	169.97	-1.36	-0.73	ZZ
MUWHD8	*	166.00	-3.66	-2.58	170.00	-1.33	-0.71	ZZ
NXP3UV		166.67	-2.99	-2.11	169.37	-1.96	-1.05	ZZ
NXUJTU		172.87	3.22	2.27	174.11	2.78	1.48	ZZ
PVDX8X	M	12,982	12,812.01	9,046.0	No Data Reported			ZZ
QQJCZV		169.60	-0.06	-0.04	168.27	-3.06	-1.63	ZZ
QTNP23		170.74	1.08	0.76	168.46	-2.87	-1.53	ZZ
QUJCD8		168.27	-1.39	-0.98	171.27	-0.06	-0.03	ZZ
RQX3JZ		168.00	-1.66	-1.17	170.70	-0.63	-0.34	ZZ
RV843H		169.78	0.12	0.09	172.34	1.01	0.54	ZZ
T34H4A		171.66	2.01	1.42	173.70	2.37	1.26	ZZ
TEYTAV	X	174.99	5.33	3.76	179.11	7.78	4.14	ZZ
TFA97H		170.52	0.87	0.61	168.56	-2.78	-1.48	ZZ
TG73P8		170.77	1.11	0.78	172.70	1.37	0.73	ZZ
U4C3BB		169.20	-0.46	-0.32	169.53	-1.80	-0.96	ZZ
UVMA4K		167.48	-2.17	-1.53	173.15	1.82	0.97	ZZ
VTQACY		169.67	0.01	0.01	174.00	2.67	1.42	ZZ
W86XY2		170.50	0.84	0.60	168.23	-3.10	-1.65	ZZ
W8998R		171.61	1.96	1.38	171.39	0.06	0.03	ZZ
WZ7YYE		170.04	0.39	0.27	173.33	2.00	1.06	ZZ
X2YJWX		169.78	0.12	0.09	171.75	0.42	0.22	ZZ
XEKV98		168.53	-1.12	-0.79	172.86	1.52	0.81	ZZ
XUY2GK		168.44	-1.22	-0.86	169.79	-1.54	-0.82	ZZ
Y2RT2Y		166.64	-3.02	-2.13	169.36	-1.97	-1.05	ZZ
YR7J26		169.88	0.22	0.15	168.92	-2.42	-1.29	ZZ
Z4CZ38		171.19	1.54	1.09	169.41	-1.93	-1.03	ZZ
ZLWHHM		170.60	0.95	0.67	172.85	1.52	0.81	ZZ

Summary Statistics

	Sample Q31		Sample Q32	
Grand Means	169.66	ksi	171.33	ksi
Std Dev Btwn Labs	1.42	ksi	1.88	ksi

Samples Q31 , Q32 : Fastener sizes: 3/8-16 x 2, 3/8-16 x 2

Statistics based on 79 of 89 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 116

Fastener Axial Tensile - ksi
ASTM F606

Comments on assigned Data Flags for Analysis #116

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
6LZXHF	X	Data for both samples are low.
87X7MP	X	Data for both samples are high. Inconsistent within the determinations of both samples.
8NVEGU	X	Data for sample Q32 are high.
C3Z32K	X	Data for both samples are low.
CWY2MC	X	Data for both samples are low.
FBMBX7	X	Data for sample Q31 are high.
G4HZ3X	X	Data for both samples are high.
L6FPNP	X	Data for sample Q31 are high.
PVDX8X	M	Laboratory did not submit data for sample Q32. Extreme Data for Sample Q31.
TEYTAV	X	Data for both samples are high.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 116

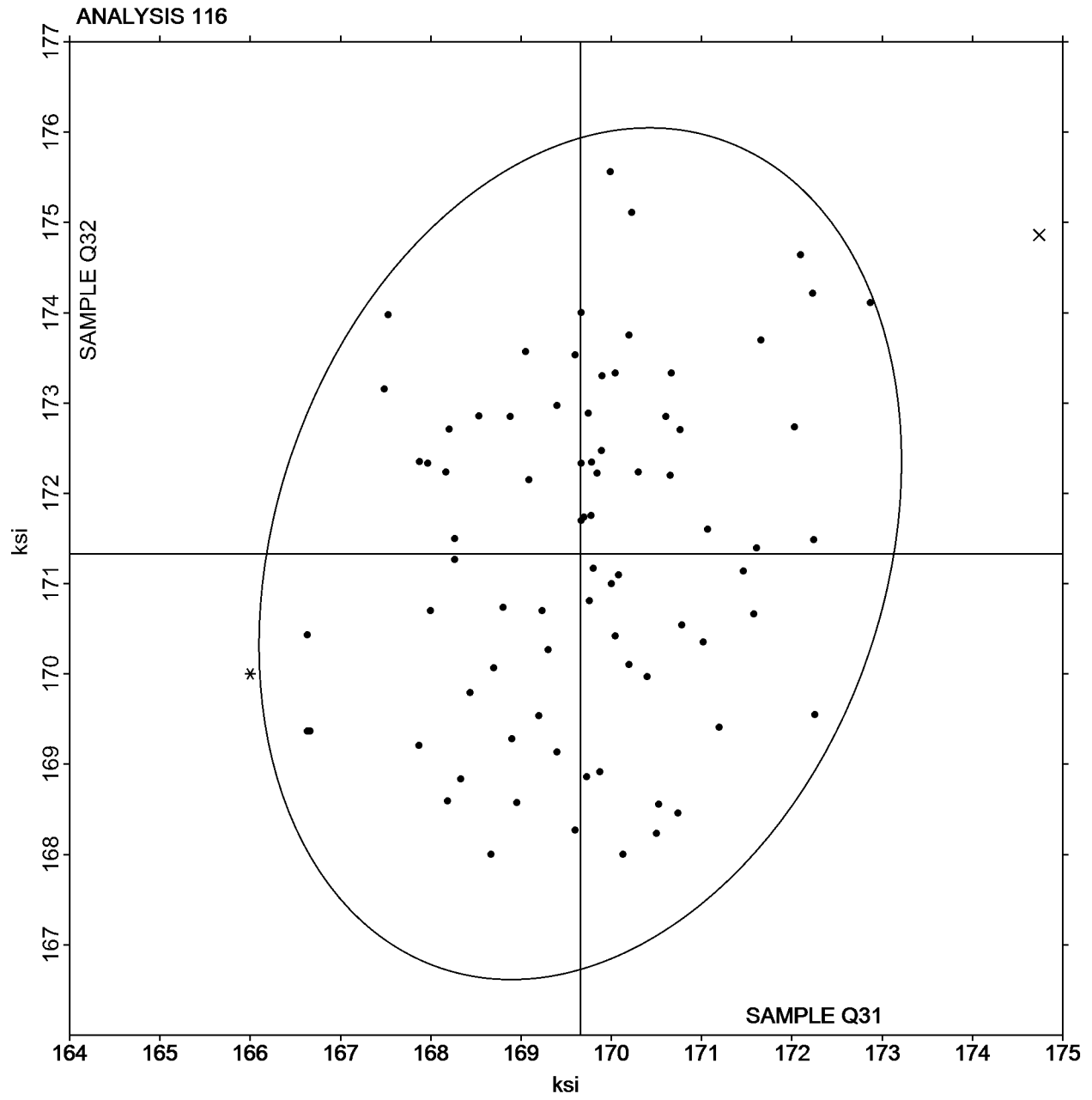
Fastener Axial Tensile - ksi
ASTM F606

SAMPLE Q31

169.66 ksi

SAMPLE Q32

171.33 ksi



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 120

Rockwell Hardness (C Scale) - HRC

ASTM E18

WebCode	Data Flag	Sample E31			Sample E32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23W49L		58.50	0.36	0.85	53.60	0.59	1.26	ZZ
3FE9WU		57.88	-0.26	-0.61	52.82	-0.19	-0.40	ZZ
44368Q	X	58.10	-0.04	-0.09	53.80	0.79	1.69	ZZ
46ETTB		58.42	0.28	0.66	53.18	0.17	0.36	ZZ
69X3L9		58.00	-0.14	-0.33	52.68	-0.33	-0.70	ZZ
6A34X7		58.68	0.54	1.28	53.40	0.39	0.83	ZZ
6EFRTW		57.92	-0.22	-0.52	52.88	-0.13	-0.28	ZZ
6EJCJK		57.62	-0.52	-1.22	52.58	-0.43	-0.92	ZZ
6GPKZH		57.62	-0.52	-1.22	52.30	-0.71	-1.51	ZZ
6J9NHM	X	55.90	-2.24	-5.28	49.48	-3.53	-7.52	ZZ
6W4TWE	X	55.36	-2.78	-6.56	52.46	-0.55	-1.17	ZZ
734RPF		58.10	-0.04	-0.09	52.90	-0.11	-0.23	ZZ
7PAM7H		58.42	0.28	0.66	53.24	0.23	0.49	ZZ
827NL8		58.00	-0.14	-0.33	52.44	-0.57	-1.21	ZZ
82NR47		58.46	0.32	0.76	53.30	0.29	0.62	ZZ
83YUP4		58.20	0.06	0.15	53.36	0.35	0.75	ZZ
8BAWB6		58.14	0.01	0.01	52.64	-0.37	-0.79	ZZ
8BQC4D		58.10	-0.04	-0.09	53.14	0.13	0.28	ZZ
8H9MBL		58.44	0.30	0.71	53.24	0.23	0.49	ZZ
9EM7T2	X	57.20	-0.94	-2.22	51.00	-2.01	-4.28	ZZ
9Z86UP		58.38	0.24	0.57	53.36	0.35	0.75	ZZ
AFJTVW		58.18	0.04	0.10	53.18	0.17	0.36	ZZ
APKKUP		58.30	0.16	0.38	53.30	0.29	0.62	ZZ
AQBNHQ		58.48	0.34	0.81	53.40	0.39	0.83	ZZ
AQEZQG		57.76	-0.38	-0.89	52.36	-0.65	-1.38	ZZ
AZLQ4R		58.72	0.58	1.37	53.24	0.23	0.49	ZZ
BBETKQ		57.92	-0.22	-0.52	52.66	-0.35	-0.74	ZZ
BW2C4N	*	57.06	-1.08	-2.55	52.20	-0.81	-1.73	ZZ
BY7QMM		58.10	-0.04	-0.09	53.20	0.19	0.41	ZZ
C4UT6D		58.34	0.20	0.48	53.30	0.29	0.62	ZZ
D3YPRW		58.22	0.08	0.19	52.70	-0.31	-0.66	ZZ
DGDXRZ		58.36	0.22	0.52	53.46	0.45	0.96	ZZ
DJQKCZ		58.20	0.06	0.15	53.54	0.53	1.13	ZZ
DNEANX		57.80	-0.34	-0.80	52.28	-0.73	-1.55	ZZ
DU4MPK		58.08	-0.06	-0.14	52.92	-0.09	-0.19	ZZ
DY2YVJ		58.28	0.14	0.33	53.26	0.25	0.53	ZZ
EFF482		58.48	0.34	0.81	53.16	0.15	0.32	ZZ
EKVEK6		57.36	-0.78	-1.84	52.26	-0.75	-1.60	ZZ
EREV2L		57.68	-0.46	-1.08	52.76	-0.25	-0.53	ZZ
ETACDH		57.12	-1.02	-2.40	52.06	-0.95	-2.02	ZZ
EUYU6H		58.00	-0.14	-0.33	53.10	0.09	0.19	ZZ
EVZDJ7		58.30	0.16	0.38	53.14	0.13	0.28	ZZ
F7BE8B		58.68	0.54	1.28	53.44	0.43	0.92	ZZ
FBMBX7		58.10	-0.04	-0.09	53.10	0.09	0.19	ZZ
FLXWUK		58.26	0.12	0.29	53.38	0.37	0.79	ZZ
FZ4QNH		57.72	-0.42	-0.99	52.50	-0.51	-1.09	ZZ
G3LKQ2		58.68	0.54	1.28	53.46	0.45	0.96	ZZ
G3ZVHE		58.51	0.37	0.88	53.56	0.55	1.16	ZZ
GFAA2Z		58.10	-0.04	-0.09	53.00	-0.01	-0.02	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 120

Rockwell Hardness (C Scale) - HRC

ASTM E18

WebCode	Data Flag	Sample E31			Sample E32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
H6R3QH		58.26	0.12	0.29	53.22	0.21	0.45	ZZ
HHWBH9	*	57.00	-1.14	-2.69	52.22	-0.79	-1.68	ZZ
J32FBZ		58.44	0.30	0.71	53.40	0.39	0.83	ZZ
J3D6NK		57.54	-0.60	-1.41	52.08	-0.93	-1.98	ZZ
J96C7T		57.84	-0.30	-0.70	52.86	-0.15	-0.32	ZZ
JACRDY		58.78	0.64	1.51	53.76	0.75	1.60	ZZ
JFNTKN		58.42	0.28	0.66	53.39	0.38	0.81	ZZ
JGJBMP		57.36	-0.78	-1.84	52.38	-0.63	-1.34	ZZ
JJ8KXC		59.04	0.90	2.13	53.94	0.93	1.98	ZZ
KFHMYK		58.12	-0.02	-0.04	52.82	-0.19	-0.40	ZZ
L2WULX		58.88	0.74	1.75	53.68	0.67	1.43	ZZ
LARLEK		58.00	-0.14	-0.33	53.06	0.05	0.11	ZZ
LDPD3N		58.68	0.54	1.28	53.78	0.77	1.64	ZZ
LW3XW7		58.36	0.22	0.52	53.22	0.21	0.45	ZZ
LYA9TA		59.00	0.86	2.03	54.00	0.99	2.11	ZZ
MQRY6D		57.80	-0.34	-0.80	52.90	-0.11	-0.23	ZZ
MY7YMV		57.66	-0.48	-1.13	52.98	-0.03	-0.06	ZZ
NC9RPR		57.84	-0.30	-0.70	52.58	-0.43	-0.92	ZZ
NTZPT9		58.06	-0.08	-0.18	53.08	0.07	0.15	ZZ
NZY4Q3		58.68	0.54	1.28	53.44	0.43	0.92	ZZ
P32CJJ		57.74	-0.40	-0.94	52.36	-0.65	-1.38	ZZ
PVDX8X		57.70	-0.44	-1.03	52.10	-0.91	-1.94	ZZ
QN9ELE		58.50	0.36	0.85	53.52	0.51	1.09	ZZ
QWNX4R		58.88	0.74	1.75	53.76	0.75	1.60	ZZ
R6E6Y3		58.06	-0.08	-0.18	53.16	0.15	0.32	ZZ
RQX3JZ		57.94	-0.20	-0.47	52.68	-0.33	-0.70	ZZ
RWJZ9M	*	58.82	0.68	1.61	53.24	0.23	0.49	ZZ
TFU3UY		57.64	-0.50	-1.18	52.34	-0.67	-1.43	ZZ
UA3E9R		58.10	-0.04	-0.09	53.34	0.33	0.70	ZZ
V4N7EZ		58.00	-0.14	-0.33	53.00	-0.01	-0.02	ZZ
VBR4AJ	*	57.58	-0.56	-1.32	51.88	-1.13	-2.41	ZZ
W3VMXK		58.34	0.20	0.48	53.24	0.23	0.49	ZZ
W86XY2		58.32	0.18	0.43	53.04	0.03	0.07	ZZ
W8998R		58.22	0.08	0.19	52.66	-0.35	-0.74	ZZ
WEL7PJ		58.22	0.08	0.19	53.18	0.17	0.36	ZZ
WWN7EY		58.56	0.42	1.00	53.48	0.47	1.00	ZZ
WZ7YYE		57.52	-0.62	-1.46	52.30	-0.71	-1.51	ZZ
X2WUPE		58.40	0.26	0.62	53.00	-0.01	-0.02	ZZ
X6XURX		57.92	-0.22	-0.52	52.50	-0.51	-1.09	ZZ
XA8TKQ		58.24	0.10	0.24	53.18	0.17	0.36	ZZ
XMGJ9J		57.98	-0.16	-0.37	52.98	-0.03	-0.06	ZZ
YRRWPH		58.40	0.26	0.62	53.16	0.15	0.32	ZZ
YV6UX6		57.88	-0.26	-0.61	52.80	-0.21	-0.45	ZZ
YYL7R2		57.92	-0.22	-0.52	53.18	0.17	0.36	ZZ
ZFN8ZT	X	56.74	-1.40	-3.30	52.70	-0.31	-0.66	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 120
Rockwell Hardness (C Scale) - HRC
ASTM E18

Summary Statistics

	<u>Sample E31</u>		<u>Sample E32</u>	
Grand Means	58.14	HRC	53.01	HRC
Std Dev Btwn Labs	0.42	HRC	0.47	HRC

Samples E31 , E32 : Steel

Statistics based on 89 of 94 reporting participants

Comments on assigned Data Flags for Analysis #120

WebCode Flag Analyst Comment

44368Q X Inconsistent in testing between samples.

6J9NHM X Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of sample E32.

6W4TWE X Data for sample E31 are low. Inconsistent in testing between samples.

9EM7T2 X Data for sample E32 are low. Inconsistent in testing between samples. Inconsistent within the determinations of both samples.

ZFN8ZT X Data for sample E31 are low. Inconsistent in testing between samples.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 120

Rockwell Hardness (C Scale) - HRC

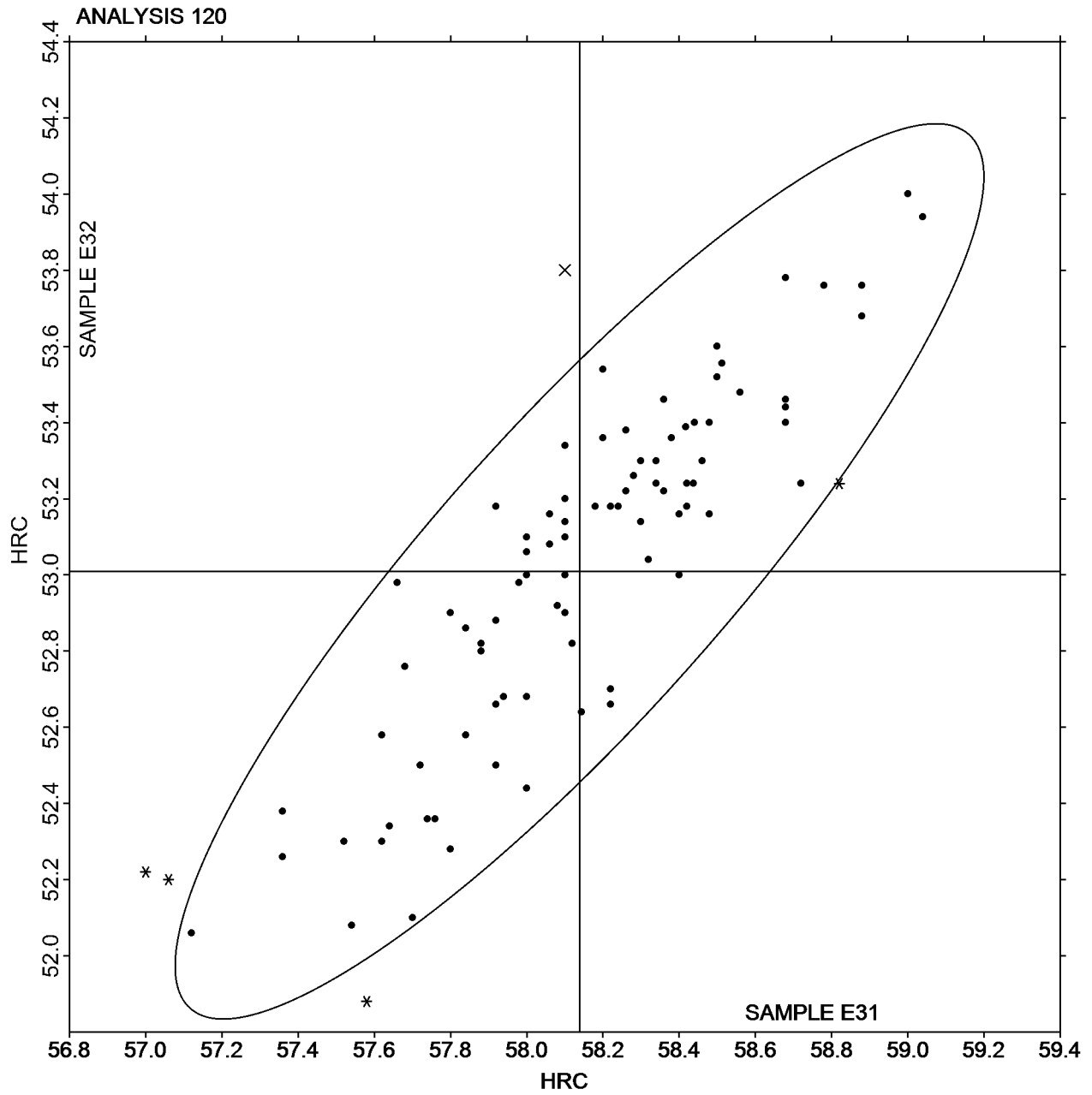
ASTM E18

SAMPLE E31

58.14 HRC

SAMPLE E32

53.01 HRC



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 125

Rockwell Hardness of Externally Threaded Fasteners - HRC
ASTM F606/F606M AND ASTM E18

WebCode	Data Flag	Sample G31			Sample G32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23ZCPM		36.76	0.65	1.02	37.00	0.45	0.80	ZZ
2DYC3Q		35.76	-0.34	-0.54	36.03	-0.53	-0.94	ZZ
2ZBEQU	*	34.79	-1.31	-2.07	36.26	-0.30	-0.53	ZZ
39YK8Y		35.84	-0.26	-0.41	36.07	-0.48	-0.86	ZZ
3H84J3		36.48	0.37	0.59	37.23	0.68	1.21	ZZ
3NDNVE		35.71	-0.40	-0.63	35.82	-0.73	-1.31	ZZ
48NX9K	X	33.52	-2.59	-4.07	31.89	-4.67	-8.33	ZZ
4QFVNR		36.46	0.36	0.56	36.46	-0.10	-0.17	ZZ
4R9Y2Y		36.19	0.08	0.13	35.94	-0.62	-1.10	ZZ
4YTV8A		36.41	0.31	0.48	36.69	0.14	0.25	ZZ
68FFL7		36.04	-0.07	-0.11	36.48	-0.07	-0.13	ZZ
68H33J		36.66	0.55	0.87	37.01	0.46	0.82	ZZ
6LZXHF		35.68	-0.43	-0.67	36.28	-0.28	-0.50	ZZ
7HF77D	X	35.94	-0.17	-0.27	34.75	-1.80	-3.22	ZZ
7JDGZV		36.26	0.16	0.24	36.75	0.20	0.35	ZZ
7MRD7W	*	34.88	-1.23	-1.94	35.13	-1.43	-2.55	ZZ
7U8WPW		36.30	0.19	0.30	36.21	-0.35	-0.62	ZZ
87X7MP		37.08	0.97	1.53	36.93	0.38	0.68	ZZ
8BQC4D		36.68	0.57	0.90	37.23	0.67	1.20	ZZ
8PW2M9		36.21	0.11	0.17	36.12	-0.43	-0.78	ZZ
8R2UEL		36.16	0.06	0.09	36.53	-0.03	-0.05	ZZ
9XG27P		36.43	0.32	0.51	36.46	-0.10	-0.17	ZZ
A48LWC		36.58	0.47	0.74	37.14	0.59	1.06	ZZ
ACTWW6		36.87	0.76	1.20	37.46	0.90	1.61	ZZ
AMV6NN		35.81	-0.30	-0.47	37.09	0.53	0.95	ZZ
AW78AP		36.45	0.34	0.54	36.17	-0.38	-0.69	ZZ
B38VfV		36.19	0.09	0.14	35.98	-0.57	-1.02	ZZ
BDA349		36.70	0.59	0.93	37.06	0.50	0.90	ZZ
BR7H7M		35.69	-0.42	-0.66	36.69	0.14	0.25	ZZ
C4WUV6		37.05	0.94	1.48	37.66	1.10	1.97	ZZ
C6RA83		36.80	0.69	1.09	37.28	0.73	1.30	ZZ
C6RCW8		37.03	0.92	1.45	37.04	0.48	0.86	ZZ
CK7H7K		36.88	0.77	1.22	37.02	0.47	0.83	ZZ
CWY2MC	X	27.84	-8.26	-13.00	25.89	-10.67	-19.04	ZZ
DFQAFZ	X	32.08	-4.03	-6.34	30.91	-5.65	-10.08	ZZ
DVH8HV		36.51	0.41	0.64	36.81	0.25	0.45	ZZ
EJJTYA		36.34	0.24	0.37	36.84	0.28	0.51	ZZ
EVWTV4		36.31	0.21	0.32	36.86	0.30	0.54	ZZ
EVZDJ7		36.58	0.47	0.74	36.61	0.06	0.11	ZZ
EWBDF2		36.01	-0.09	-0.15	37.06	0.51	0.91	ZZ
EX2JWR		36.38	0.27	0.43	37.19	0.64	1.14	ZZ
FHHDZH		35.68	-0.43	-0.67	36.67	0.12	0.21	ZZ
FPKEEQ		37.14	1.04	1.63	37.47	0.92	1.63	ZZ
FXG67T		35.63	-0.48	-0.75	36.18	-0.38	-0.68	ZZ
G4HZ3X		36.27	0.16	0.25	36.76	0.20	0.36	ZZ
G9BXTA		36.24	0.14	0.21	36.96	0.41	0.73	ZZ
GJ9X7E		34.73	-1.38	-2.17	35.24	-1.32	-2.35	ZZ
GWK2UX		36.43	0.32	0.50	37.01	0.46	0.82	ZZ
HEGQN7		36.00	-0.11	-0.17	36.94	0.38	0.69	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 125

Rockwell Hardness of Externally Threaded Fasteners - HRC
ASTM F606/F606M AND ASTM E18

WebCode	Data Flag	Sample G31			Sample G32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
HQADU2		36.00	-0.11	-0.17	36.32	-0.23	-0.42	ZZ
HZCRDE		36.26	0.16	0.24	37.08	0.52	0.93	ZZ
J8TMT9		37.01	0.90	1.41	37.66	1.10	1.97	ZZ
JWPHTE		36.13	0.02	0.03	36.27	-0.29	-0.51	ZZ
KAC6LD		35.98	-0.13	-0.21	36.09	-0.46	-0.82	ZZ
L6FPNP		35.57	-0.54	-0.85	36.83	0.28	0.50	ZZ
L93EYU		35.81	-0.29	-0.46	35.95	-0.60	-1.08	ZZ
LH33QR		36.63	0.52	0.81	36.76	0.21	0.37	ZZ
LT7ZY2		36.92	0.81	1.28	37.38	0.82	1.47	ZZ
LYA9TA		36.88	0.77	1.21	36.63	0.07	0.13	ZZ
M2W3CW		36.01	-0.10	-0.16	36.25	-0.30	-0.54	ZZ
M8LH7V	*	34.69	-1.41	-2.22	36.22	-0.33	-0.60	ZZ
MFGK97		36.49	0.39	0.61	36.51	-0.04	-0.07	ZZ
MUWH8	*	34.51	-1.59	-2.51	36.05	-0.50	-0.90	ZZ
NXP3UV		36.61	0.50	0.79	36.78	0.23	0.41	ZZ
NXUJTU		35.99	-0.12	-0.19	36.44	-0.12	-0.21	ZZ
NZF9BL	*	34.53	-1.57	-2.48	35.33	-1.23	-2.19	ZZ
QHRTM9		36.42	0.31	0.49	36.91	0.35	0.63	ZZ
QKX4V6		35.92	-0.19	-0.30	36.23	-0.32	-0.57	ZZ
QUJCD8		36.33	0.22	0.34	36.26	-0.30	-0.53	ZZ
QVTE3Q		36.25	0.14	0.22	36.90	0.35	0.62	ZZ
R6W3HU		37.13	1.02	1.61	37.43	0.88	1.57	ZZ
RB642D		35.50	-0.61	-0.96	36.03	-0.53	-0.94	ZZ
RP488P		36.04	-0.07	-0.11	36.42	-0.13	-0.24	ZZ
RQX3JZ		35.78	-0.33	-0.52	35.59	-0.96	-1.71	ZZ
T9BWXR		35.26	-0.84	-1.33	35.95	-0.60	-1.08	ZZ
TEYTAV	X	33.28	-2.83	-4.46	32.64	-3.92	-6.99	ZZ
TFA97H		36.29	0.19	0.29	37.44	0.88	1.58	ZZ
TG73P8		36.49	0.38	0.60	36.77	0.22	0.38	ZZ
U4C3BB		35.74	-0.37	-0.58	36.72	0.17	0.30	ZZ
UVMA4K		35.97	-0.14	-0.22	35.96	-0.60	-1.07	ZZ
UWXW2Y		35.73	-0.38	-0.60	35.88	-0.68	-1.21	ZZ
V7FA32	*	34.75	-1.36	-2.14	36.25	-0.30	-0.54	ZZ
VTQACY		35.42	-0.69	-1.08	35.89	-0.67	-1.19	ZZ
WZ7YYE		36.01	-0.09	-0.15	36.41	-0.15	-0.26	ZZ
X2YJWX		36.13	0.02	0.03	36.16	-0.40	-0.71	ZZ
XHMKZF		36.08	-0.03	-0.05	36.70	0.15	0.26	ZZ
XUY2GK		35.84	-0.27	-0.42	36.12	-0.43	-0.78	ZZ
YR7J26		36.63	0.52	0.81	36.74	0.19	0.34	ZZ
ZECN3G		36.01	-0.10	-0.16	36.78	0.23	0.41	ZZ
ZHVGEJ		36.26	0.15	0.23	36.65	0.10	0.17	ZZ
ZLWHHM	*	34.18	-1.93	-3.03	35.12	-1.44	-2.56	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 125

Rockwell Hardness of Externally Threaded Fasteners - HRC
ASTM F606/F606M AND ASTM E18

Summary Statistics

	<u>Sample G31</u>		<u>Sample G32</u>	
Grand Means	36.11	HRC	36.55	HRC
Std Dev Btwn Labs	0.64	HRC	0.56	HRC

Samples G31 , G32 : Fastener sizes: 1/2-20 x 2 1/2 , 1/2-20 x 1/4

Statistics based on 86 of 91 reporting participants

Comments on assigned Data Flags for Analysis #125

WebCode Flag Analyst Comment

48NX9K	X	Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of sample G32.
7HF77D	X	Data for sample G32 are low. Inconsistent in testing between samples. Inconsistent within the determinations of sample G32.
CWY2MC	X	Data for both samples are low. Possible Systematic error.
DFQAFZ	X	Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of both samples.
TEYTAV	X	Data for both samples are low. Possible Systematic error.

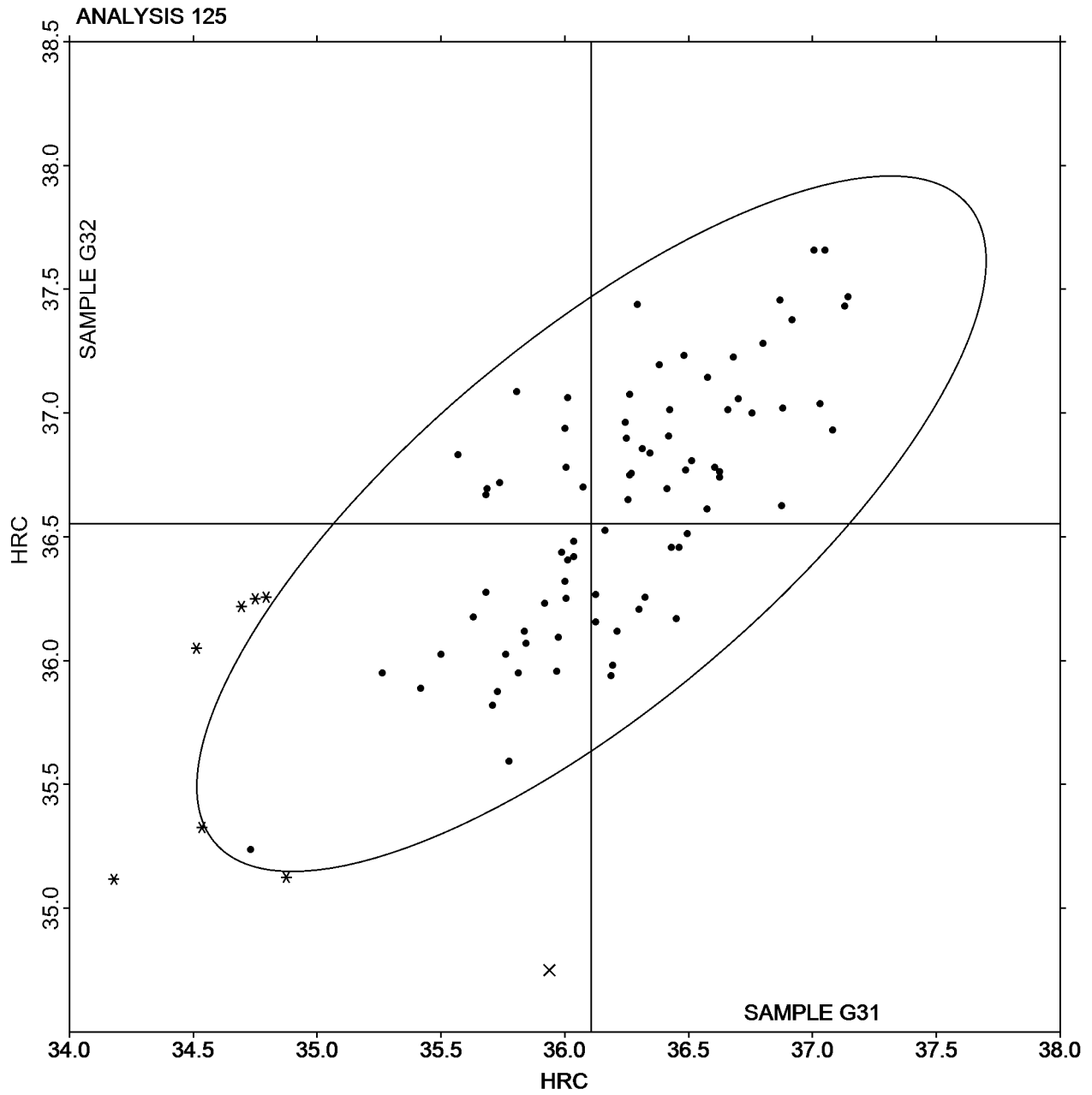
Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 125

Rockwell Hardness of Externally Threaded Fasteners - HRC
ASTM F606/F606M AND ASTM E18

SAMPLE G31
36.11 HRC

SAMPLE G32
36.55 HRC



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 126

Vickers Hardness of Externally Threaded Fasteners - HV
ASTM E384

WebCode	Data Flag	Sample V31			Sample V32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
36Z99D		353.94	-3.19	-0.69	357.75	-6.35	-1.18	ZZ
673VTV		350.56	-6.57	-1.41	362.46	-1.64	-0.31	ZZ
68H33J		359.19	2.06	0.44	372.69	8.58	1.60	ZZ
6BZ8YU		349.93	-7.21	-1.55	357.69	-6.41	-1.19	ZZ
7PDVNH		358.00	0.87	0.19	365.94	1.83	0.34	ZZ
8PW2M9		350.44	-6.69	-1.44	352.19	-11.92	-2.22	ZZ
9YD68C		350.66	-6.47	-1.39	361.04	-3.06	-0.57	ZZ
AMV6NN		361.25	4.12	0.88	366.56	2.46	0.46	ZZ
EVUC7J		367.95	10.82	2.32	373.96	9.86	1.84	ZZ
FHHDZH		351.03	-6.10	-1.31	371.14	7.04	1.31	ZZ
H29BDU		361.75	4.62	0.99	367.38	3.27	0.61	ZZ
L2WULX		357.06	-0.07	-0.01	365.19	1.08	0.20	ZZ
LT7ZY2		357.13	-0.01	0.00	359.75	-4.35	-0.81	ZZ
NQ8T7Y		355.69	-1.44	-0.31	366.88	2.77	0.52	ZZ
NTZPT9		357.90	0.77	0.17	368.78	4.67	0.87	ZZ
PM64C6		360.26	3.13	0.67	367.48	3.37	0.63	ZZ
QKX4V6		361.71	4.58	0.98	363.06	-1.04	-0.19	ZZ
UD46V7		363.55	6.42	1.38	357.51	-6.59	-1.23	ZZ
UVMA4K		356.69	-0.44	-0.10	364.25	0.15	0.03	ZZ
VTQACY		356.88	-0.26	-0.05	360.94	-3.17	-0.59	ZZ
WZBJLG		355.44	-1.69	-0.36	364.19	0.08	0.02	ZZ
XA8TKQ		360.28	3.15	0.68	368.40	4.29	0.80	ZZ
YJV7YF		356.75	-0.38	-0.08	359.19	-4.92	-0.92	ZZ

Summary Statistics

	<u>Sample V31</u>		<u>Sample V32</u>	
Grand Means	357.13	HV	364.10	HV
Std Dev Btwn Labs	4.66	HV	5.37	HV

Samples V31 , V32 : Fastener sizes: 1/2-20 x 2 3/4 , 1/2-20 x 1/4

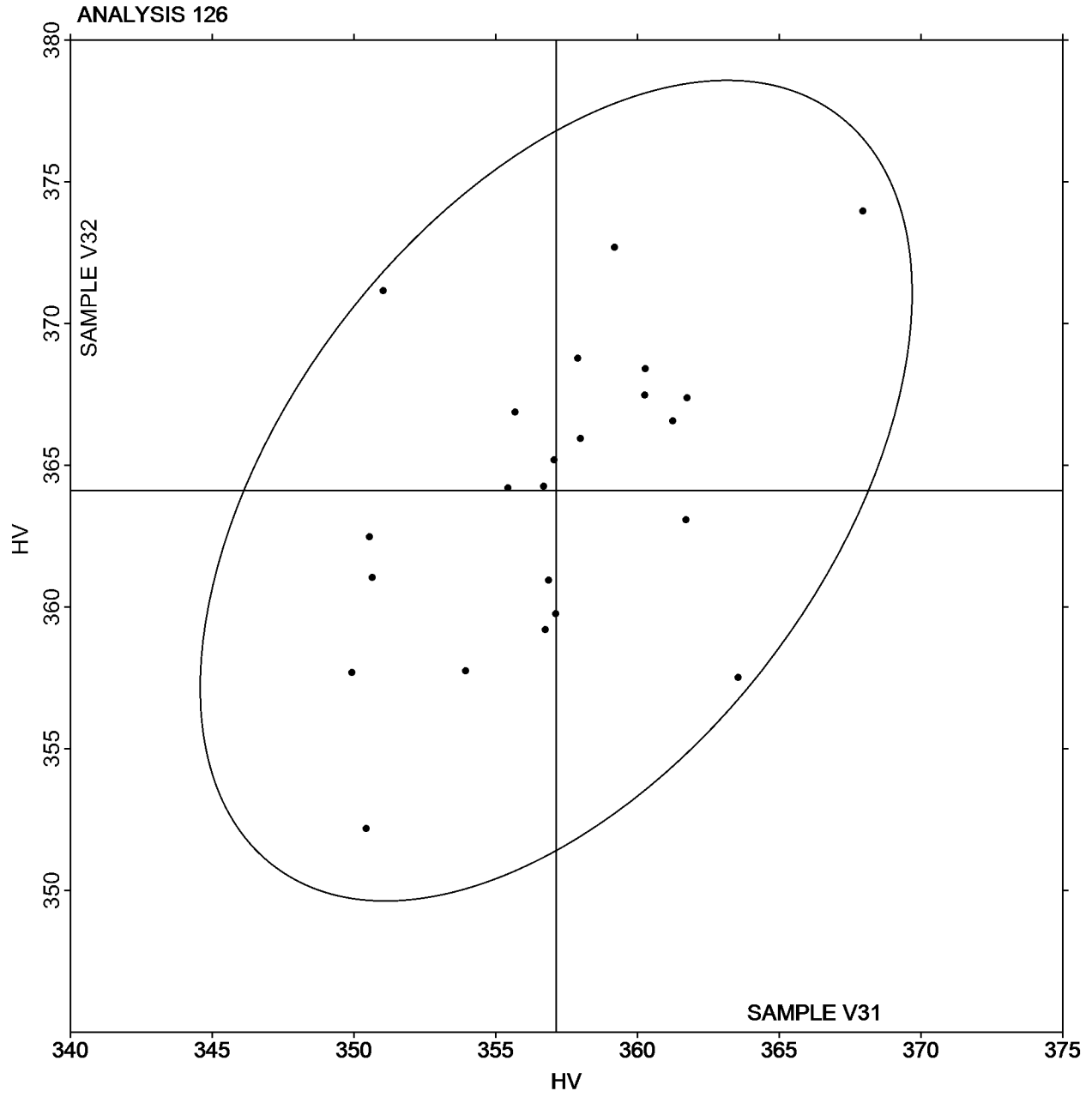
Statistics based on 23 of 23 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 126
Vickers Hardness of Externally Threaded Fasteners - HV
ASTM E384

SAMPLE V31
357.13 HV

SAMPLE V32
364.10 HV



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 127

Fastener Wedge Tensile (10 deg) Metric - MPa
ASTM F606M

WebCode	Data Flag	Sample B31			Sample B32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2KW2GA		1,161	-10	-0.94	1,115	-20	-1.71	ZZ
2ZBEQU		1,178	7	0.67	1,140	5	0.41	ZZ
3H84J3		1,165	-6	-0.60	1,133	-2	-0.20	ZZ
4R9Y2Y	*	1,179	8	0.79	1,167	32	2.64	ZZ
6BZ8YU		1,191	20	1.92	1,150	15	1.27	ZZ
7PDVNH		1,159	-12	-1.10	1,119	-16	-1.32	ZZ
82NR47		1,186	15	1.47	1,151	16	1.36	ZZ
8PW2M9		1,170	-1	-0.12	1,133	-2	-0.15	ZZ
BR7H7M		1,169	-2	-0.17	1,136	1	0.06	ZZ
CK7H7K		1,181	10	0.93	1,141	5	0.46	ZZ
FHHDZH		1,165	-6	-0.54	1,133	-3	-0.22	ZZ
FPKEEQ		1,180	9	0.83	1,139	4	0.32	ZZ
LTN7XQ		1,179	8	0.75	1,131	-4	-0.33	ZZ
M8LH7V		1,177	6	0.54	1,138	3	0.24	ZZ
NXP3UV	*	1,141	-30	-2.81	1,117	-18	-1.55	ZZ
NZF9BL		1,165	-6	-0.60	1,129	-6	-0.51	ZZ
PNFWFK		1,164	-7	-0.66	1,123	-12	-1.05	ZZ
QKX4V6		1,159	-12	-1.10	1,129	-6	-0.54	ZZ
QVTE3Q		1,167	-4	-0.41	1,126	-9	-0.77	ZZ
R6W3HU		1,181	10	0.91	1,143	8	0.64	ZZ
T9BWXR		1,163	-8	-0.73	1,125	-10	-0.85	ZZ
V7FA32		1,171	0	0.00	1,132	-3	-0.29	ZZ
VTQACY		1,181	10	0.98	1,153	18	1.52	ZZ
WZBJLG		1,177	6	0.57	1,128	-7	-0.56	ZZ
XHMKZF		1,168	-3	-0.31	1,142	6	0.53	ZZ
ZECN3G		1,168	-3	-0.25	1,142	7	0.60	ZZ

Summary Statistics

	Sample B31		Sample B32	
Grand Means	1,171	MPa	1,135	MPa
Std Dev Btwn Labs	11	MPa	12	MPa

Samples B31 , B32 : Fastener sizes: M10 x 1.5 x 70, M10 x 1.5 x 80

Statistics based on 26 of 26 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 127

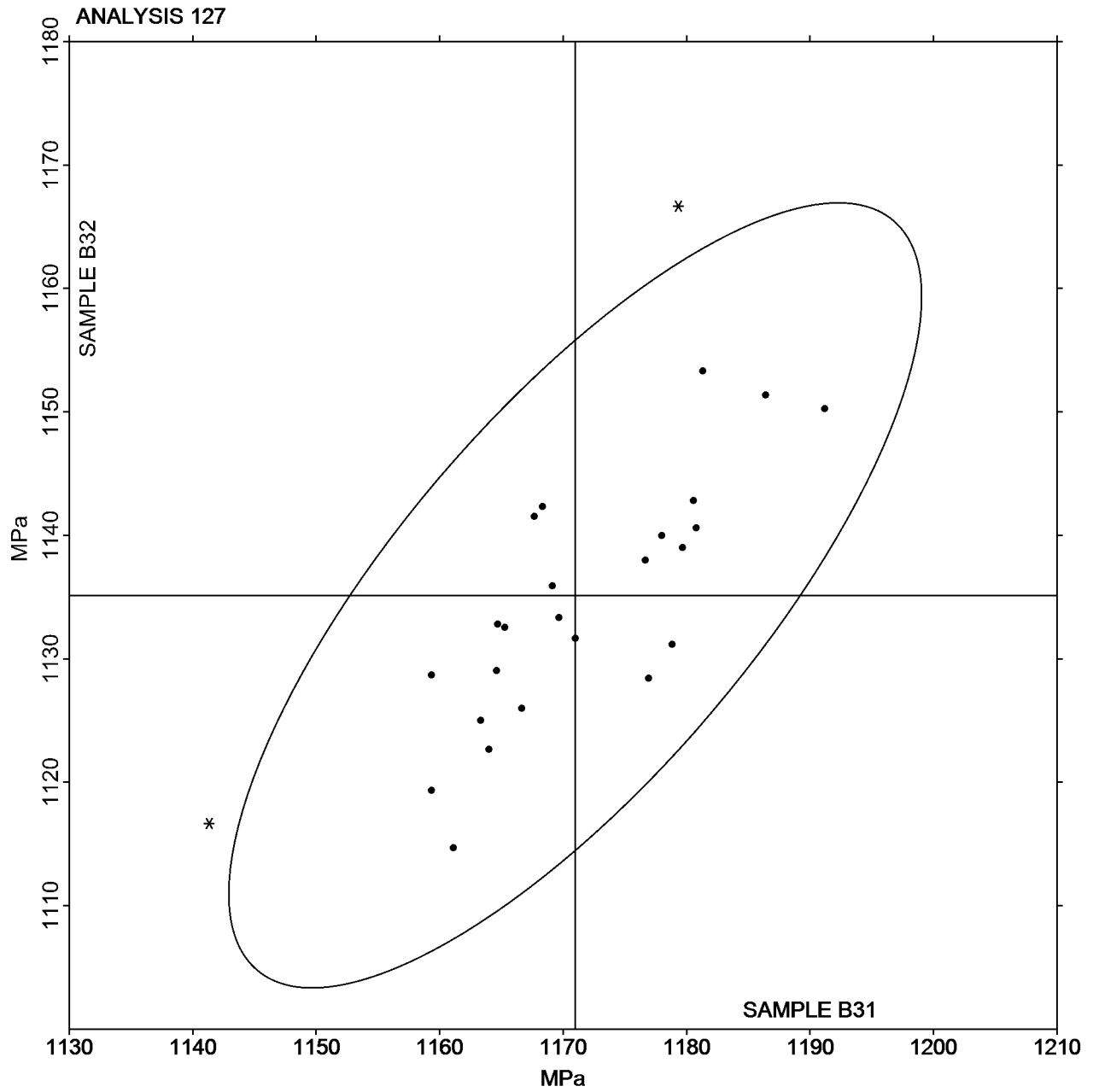
Fastener Wedge Tensile (10 deg) Metric - MPa
ASTM F606M

SAMPLE B31

1,171 MPa

SAMPLE B32

1,135 MPa



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 128

Fastener Axial Tensile Metric - MPa
ASTM F606M

WebCode	Data Flag	Sample T31			Sample T32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2KW2GA		1,113	-10	-0.92	1,117	-15	-1.39	ZZ
3FYTMV		1,112	-12	-1.04	1,116	-16	-1.54	ZZ
4YTV8A		1,114	-9	-0.84	1,134	2	0.17	ZZ
8PW2M9		1,128	5	0.40	1,144	12	1.09	ZZ
J8TMT9		1,119	-5	-0.46	1,133	1	0.08	ZZ
LTN7XQ		1,123	-1	-0.07	1,141	9	0.85	ZZ
PJ372C		1,102	-21	-1.89	1,116	-16	-1.48	ZZ
QKX4V6		1,127	3	0.28	1,125	-7	-0.63	ZZ
R6W3HU		1,135	11	0.98	1,134	2	0.21	ZZ
T9BWXR		1,126	2	0.19	1,129	-3	-0.26	ZZ
UWXW2Y		1,134	11	0.93	1,134	2	0.15	ZZ
VTQACY		1,147	24	2.07	1,152	20	1.90	ZZ
WZBJLG		1,129	5	0.43	1,135	3	0.26	ZZ
X2YJWX		1,123	-1	-0.06	1,139	6	0.61	ZZ

Summary Statistics

	<u>Sample T31</u>		<u>Sample T32</u>	
Grand Means	1,124	MPa	1,132	MPa
Std Dev Btwn Labs	11	MPa	11	MPa

Samples T31 , T32 : Fastener sizes: M10 x 1.5 x 70, M10 x 1.5 x 80

Statistics based on 14 of 14 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 128

Fastener Axial Tensile Metric - MPa

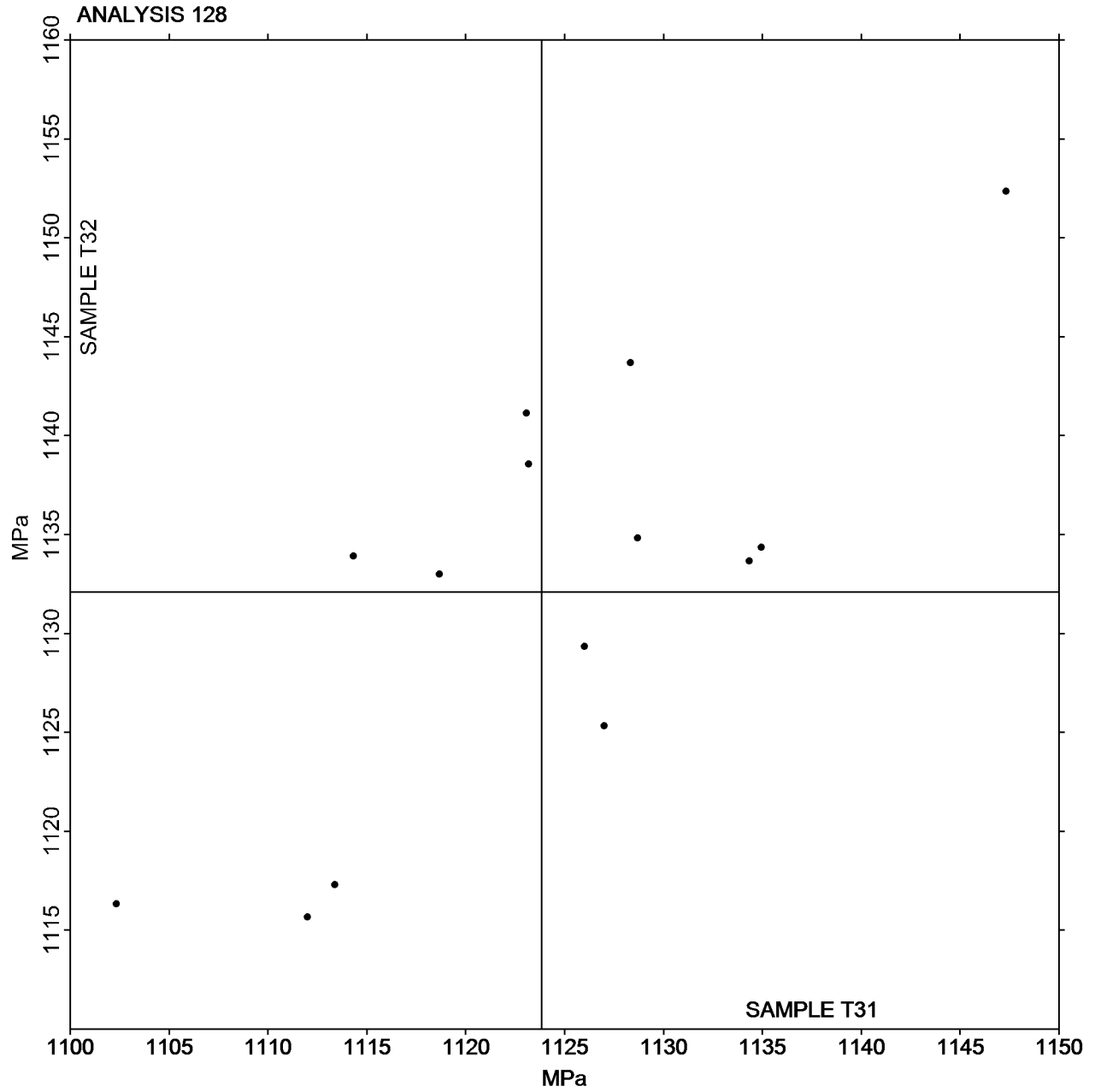
ASTM F606M

SAMPLE T31

1,124 MPa

SAMPLE T32

1,132 MPa



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 129

Fastener Double Shear - 1b
NASM 1312-13

WebCode	Data Flag	Sample Z31			Sample Z32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
4NB86V		22,583	938	2.18	22,725	1,033	2.40	ZZ
4R9Y2Y		21,685	40	0.09	21,801	108	0.25	ZZ
7U8WPW		21,530	-115	-0.27	21,893	201	0.47	ZZ
A48LWC		21,900	255	0.59	21,733	41	0.09	ZZ
C4WUV6		21,970	325	0.75	22,224	531	1.23	ZZ
C6RA83		21,804	158	0.37	21,850	157	0.37	ZZ
CNJ8LN		21,532	-113	-0.26	21,570	-123	-0.29	ZZ
CVNYR		22,165	519	1.21	22,098	405	0.94	ZZ
D3YPRW		21,805	159	0.37	21,698	5	0.01	ZZ
G4HZ3X		21,930	285	0.66	21,850	157	0.37	ZZ
GJ9X7E		21,788	142	0.33	21,725	33	0.08	ZZ
J96C7T		21,320	-325	-0.76	21,279	-414	-0.96	ZZ
JC4QUH		22,170	525	1.22	22,112	419	0.97	ZZ
L6FPNP		21,825	180	0.42	22,063	371	0.86	ZZ
L6V7GX		21,353	-292	-0.68	21,473	-219	-0.51	ZZ
LYA9TA		21,120	-525	-1.22	21,422	-270	-0.63	ZZ
M2W3CW		21,950	305	0.71	22,050	357	0.83	ZZ
M7J2GB		21,821	175	0.41	21,601	-92	-0.21	ZZ
MFGK97		21,139	-506	-1.18	20,988	-705	-1.64	ZZ
QZAX8E		21,449	-197	-0.46	21,455	-237	-0.55	ZZ
UVMA4K		21,572	-74	-0.17	21,649	-44	-0.10	ZZ
VFZDB2		21,839	193	0.45	21,638	-55	-0.13	ZZ
VTQACY	*	20,414	-1,231	-2.86	20,425	-1,268	-2.95	ZZ
W86XY2		21,616	-29	-0.07	21,409	-284	-0.66	ZZ
WKWBPJ	*	21,067	-579	-1.34	21,600	-93	-0.22	ZZ
X2YJWX		21,432	-213	-0.50	21,681	-12	-0.03	ZZ

Summary Statistics

	<u>Sample Z31</u>		<u>Sample Z32</u>	
Grand Means	21,645	1b	21,693	1b
Std Dev Btwn Labs	430	1b	430	1b

Samples Z31 , Z32 : Fastener size 3/8-16 x 2 1/4, 3/8-16 x 2 3/4

Statistics based on 26 of 26 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 129

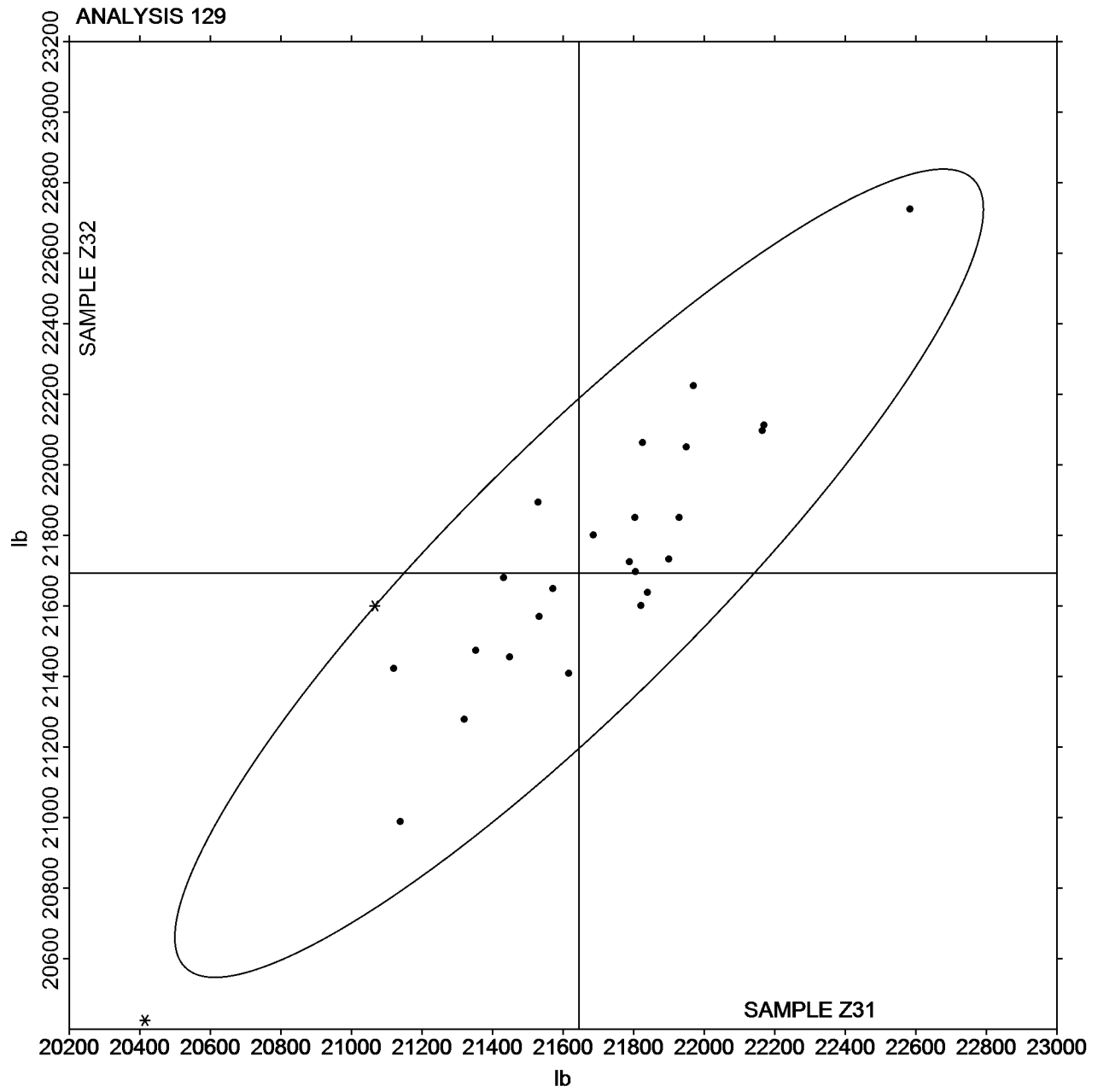
Fastener Double Shear - lb
NASM 1312-13

SAMPLE Z31

21,645 lb

SAMPLE Z32

21,693 lb



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 130

Tensile Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
272MGF		70.91	-0.34	-0.29	70.07	0.21	0.21	ZZ
3AU37E		71.60	0.34	0.29	70.17	0.31	0.31	ZZ
3H4G3P		72.60	1.35	1.13	70.40	0.55	0.55	ZZ
3PMM2G		71.79	0.54	0.45	71.94	2.09	2.08	ZZ
3RBEQT		70.78	-0.48	-0.40	69.96	0.10	0.10	ZZ
44368Q		71.07	-0.18	-0.15	68.75	-1.11	-1.11	ZZ
4C2K6B		73.40	2.15	1.80	69.33	-0.52	-0.52	ZZ
4H2AD3		71.90	0.65	0.54	70.60	0.75	0.75	ZZ
4MHEAC		70.83	-0.42	-0.35	68.93	-0.92	-0.92	ZZ
4XEHE7		72.40	1.15	0.96	70.00	0.15	0.15	ZZ
69X3L9		69.80	-1.45	-1.22	68.40	-1.45	-1.45	ZZ
768KGT		71.67	0.42	0.35	70.59	0.73	0.73	ZZ
8BAWB6		72.01	0.76	0.63	68.87	-0.98	-0.98	ZZ
9DYKBC		71.60	0.35	0.29	70.00	0.15	0.15	ZZ
9FHNTG	X	73.20	1.94	1.63	66.92	-2.94	-2.93	ZZ
9HRNZA		72.21	0.95	0.80	70.24	0.39	0.39	ZZ
9RWVEA	*	68.10	-3.15	-2.64	68.30	-1.55	-1.55	ZZ
A3NNG6		71.03	-0.23	-0.19	70.34	0.49	0.49	ZZ
AKAEDJ		71.10	-0.15	-0.13	69.29	-0.57	-0.57	ZZ
AQEZQG		69.90	-1.35	-1.13	71.00	1.15	1.15	ZZ
AWNHPA		69.80	-1.45	-1.22	67.60	-2.25	-2.25	ZZ
AY8JKV		68.71	-2.54	-2.13	68.97	-0.89	-0.88	ZZ
B34L9V		73.50	2.25	1.88	69.50	-0.35	-0.35	ZZ
B6UKNE		70.24	-1.01	-0.85	69.00	-0.86	-0.86	ZZ
BBDY2K		69.56	-1.69	-1.42	70.43	0.57	0.57	ZZ
BD7JF6		72.87	1.62	1.35	70.92	1.06	1.06	ZZ
BEHMLG		70.40	-0.85	-0.71	70.10	0.25	0.25	ZZ
BF8VQB		72.04	0.79	0.66	70.20	0.35	0.35	ZZ
BLY3AJ		71.05	-0.21	-0.17	69.97	0.11	0.11	ZZ
BN3QTF	X	75.30	4.05	3.39	69.98	0.13	0.13	ZZ
BY8U2J		72.69	1.44	1.20	69.39	-0.46	-0.46	ZZ
CBV64V		71.46	0.21	0.17	69.34	-0.51	-0.51	ZZ
CNMPRY		70.50	-0.75	-0.63	69.40	-0.45	-0.45	ZZ
CTGJPZ		69.60	-1.65	-1.38	69.45	-0.40	-0.40	ZZ
D2K3FA	*	71.40	0.15	0.12	72.40	2.55	2.55	ZZ
DAVP2H		70.90	-0.35	-0.29	69.82	-0.03	-0.03	ZZ
DFQAFZ		70.50	-0.75	-0.63	68.10	-1.75	-1.75	ZZ
DQH68Z		69.50	-1.75	-1.47	70.50	0.65	0.65	ZZ
DVYDTE		70.58	-0.67	-0.56	67.93	-1.92	-1.92	ZZ
ECPW9X		70.41	-0.84	-0.71	69.47	-0.38	-0.38	ZZ
EQZEXF		70.63	-0.62	-0.52	69.33	-0.53	-0.53	ZZ
EYCN8U		72.46	1.21	1.01	70.62	0.77	0.77	ZZ
F6XXWJ		70.40	-0.85	-0.71	69.60	-0.25	-0.25	ZZ
FMFW42		72.61	1.35	1.13	69.02	-0.83	-0.83	ZZ
FN7ZT3		69.18	-2.07	-1.73	68.17	-1.69	-1.69	ZZ
FQTQU8		71.96	0.71	0.59	71.36	1.51	1.51	ZZ
FWQYP3		72.46	1.21	1.01	68.63	-1.22	-1.22	ZZ
FXG67T		70.70	-0.55	-0.46	68.80	-1.05	-1.05	ZZ
FZ6T7Z		71.33	0.08	0.06	69.54	-0.31	-0.31	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 130

Tensile Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
G3LKQ2		70.02	-1.23	-1.03	69.94	0.08	0.08	ZZ
G9BXTA		69.70	-1.55	-1.30	70.80	0.95	0.95	ZZ
GPKPUU		71.40	0.15	0.12	70.00	0.15	0.15	ZZ
H29BDU		71.65	0.40	0.33	71.21	1.36	1.36	ZZ
H2QB8J		71.16	-0.09	-0.08	69.18	-0.68	-0.68	ZZ
HBXWKD		70.40	-0.85	-0.71	70.40	0.55	0.55	ZZ
HLGDBY		70.61	-0.64	-0.54	70.05	0.20	0.20	ZZ
HZCUZX		71.07	-0.18	-0.15	69.47	-0.38	-0.38	ZZ
JGJBMP		71.30	0.05	0.04	69.10	-0.75	-0.75	ZZ
JH8W6E		73.30	2.05	1.71	71.30	1.45	1.45	ZZ
JK34ZD		71.21	-0.04	-0.03	69.01	-0.84	-0.84	ZZ
JRWK23		73.43	2.18	1.82	70.53	0.68	0.68	ZZ
JTR444		70.20	-1.05	-0.88	69.50	-0.35	-0.35	ZZ
JWTXAL		70.66	-0.59	-0.50	68.87	-0.98	-0.98	ZZ
K87N69		71.50	0.25	0.21	70.60	0.75	0.75	ZZ
KE8Z27		71.30	0.05	0.04	68.80	-1.05	-1.05	ZZ
L7RC9P		70.70	-0.55	-0.46	68.80	-1.05	-1.05	ZZ
LGBVK9		71.46	0.21	0.17	70.11	0.26	0.26	ZZ
LXDNAG		72.20	0.95	0.79	69.70	-0.15	-0.15	ZZ
MH2L28	X	76.81	5.56	4.65	72.15	2.30	2.30	ZZ
MK8UH6		69.90	-1.35	-1.13	69.00	-0.85	-0.85	ZZ
MM7GK8		70.47	-0.78	-0.65	69.12	-0.74	-0.74	ZZ
N2A3PH		70.70	-0.55	-0.46	69.60	-0.25	-0.25	ZZ
N7K6W8		70.39	-0.87	-0.73	71.79	1.93	1.93	ZZ
NHEKJM		69.07	-2.18	-1.83	70.06	0.21	0.21	ZZ
NLYDXB		70.70	-0.55	-0.46	69.90	0.05	0.05	ZZ
P4V8XF		71.50	0.25	0.21	70.10	0.25	0.25	ZZ
P8BP34		71.10	-0.15	-0.13	69.80	-0.05	-0.05	ZZ
PNE9RE		70.70	-0.55	-0.46	68.50	-1.35	-1.35	ZZ
PQ4HXA		71.00	-0.25	-0.21	69.00	-0.85	-0.85	ZZ
Q9J68N		72.34	1.09	0.91	70.32	0.47	0.47	ZZ
QE64D4		73.37	2.12	1.78	71.62	1.76	1.76	ZZ
QGTTLM		69.50	-1.75	-1.47	70.60	0.75	0.75	ZZ
QYZNG3		71.10	-0.15	-0.13	69.60	-0.25	-0.25	ZZ
R2EU43		72.20	0.95	0.79	71.11	1.26	1.26	ZZ
R6ZCN9		71.00	-0.25	-0.21	67.90	-1.95	-1.95	ZZ
RRN9ZQ		73.10	1.85	1.55	71.10	1.25	1.25	ZZ
TFU3UY		70.00	-1.25	-1.05	69.60	-0.25	-0.25	ZZ
THYVKQ		73.50	2.25	1.88	70.00	0.15	0.15	ZZ
TTZ66U		72.01	0.76	0.63	70.12	0.27	0.27	ZZ
U3G9PY		71.04	-0.21	-0.17	69.00	-0.85	-0.85	ZZ
UCP7AW		72.08	0.83	0.70	71.79	1.94	1.94	ZZ
UR3ECL		72.30	1.05	0.88	71.20	1.35	1.35	ZZ
VEUQ23		70.40	-0.85	-0.71	68.81	-1.04	-1.04	ZZ
VNYU9L		70.74	-0.51	-0.43	68.25	-1.60	-1.60	ZZ
W6GCFC		71.80	0.55	0.46	69.80	-0.05	-0.05	ZZ
W79GNQ	X	68.50	-2.75	-2.30	66.50	-3.35	-3.35	ZZ
X9X7LC		73.68	2.43	2.03	69.75	-0.10	-0.10	ZZ
XEKV98		73.00	1.75	1.46	72.00	2.15	2.15	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 130

Tensile Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XKDNPG		70.74	-0.52	-0.43	70.87	1.01	1.01	ZZ
XMGJ9J		70.78	-0.47	-0.40	70.20	0.34	0.34	ZZ
XMV7J7	*	69.00	-2.25	-1.88	71.00	1.15	1.15	ZZ
XVRP32		73.10	1.85	1.55	69.40	-0.45	-0.45	ZZ
Y38VAT	*	70.10	-1.15	-0.96	72.00	2.15	2.15	ZZ
Y4HV99		71.80	0.55	0.46	69.90	0.05	0.05	ZZ
Y4Y3HW		72.35	1.09	0.92	69.59	-0.27	-0.27	ZZ
YDL4WK		73.70	2.45	2.05	70.20	0.35	0.35	ZZ
YN86EF		71.36	0.11	0.09	69.18	-0.67	-0.67	ZZ
YV2EFX		71.10	-0.15	-0.13	69.30	-0.55	-0.55	ZZ
Z4CZ38		73.40	2.15	1.80	71.50	1.65	1.65	ZZ
ZZYZ6F	X	75.00	3.75	3.14	73.30	3.45	3.44	ZZ

Summary Statistics

	Sample F31		Sample F32	
Grand Means	71.25	ksi	69.85	ksi
Std Dev Btwn Labs	1.20	ksi	1.00	ksi

Samples F31 , F32 : AISI 1010 - 16G , AISI 1010 - 14G

Statistics based on 105 of 110 reporting participants

Comments on assigned Data Flags for Analysis #130

WebCode Flag Analyst Comment

9FHNTG X Data for sample F32 are low.

BN3QTF X Data for sample F31 are high.

MH2L28 X Data for sample F31 are high.

W79GNQ X Data for sample F32 are low.

ZZYZ6F X Data for both samples are high.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 130

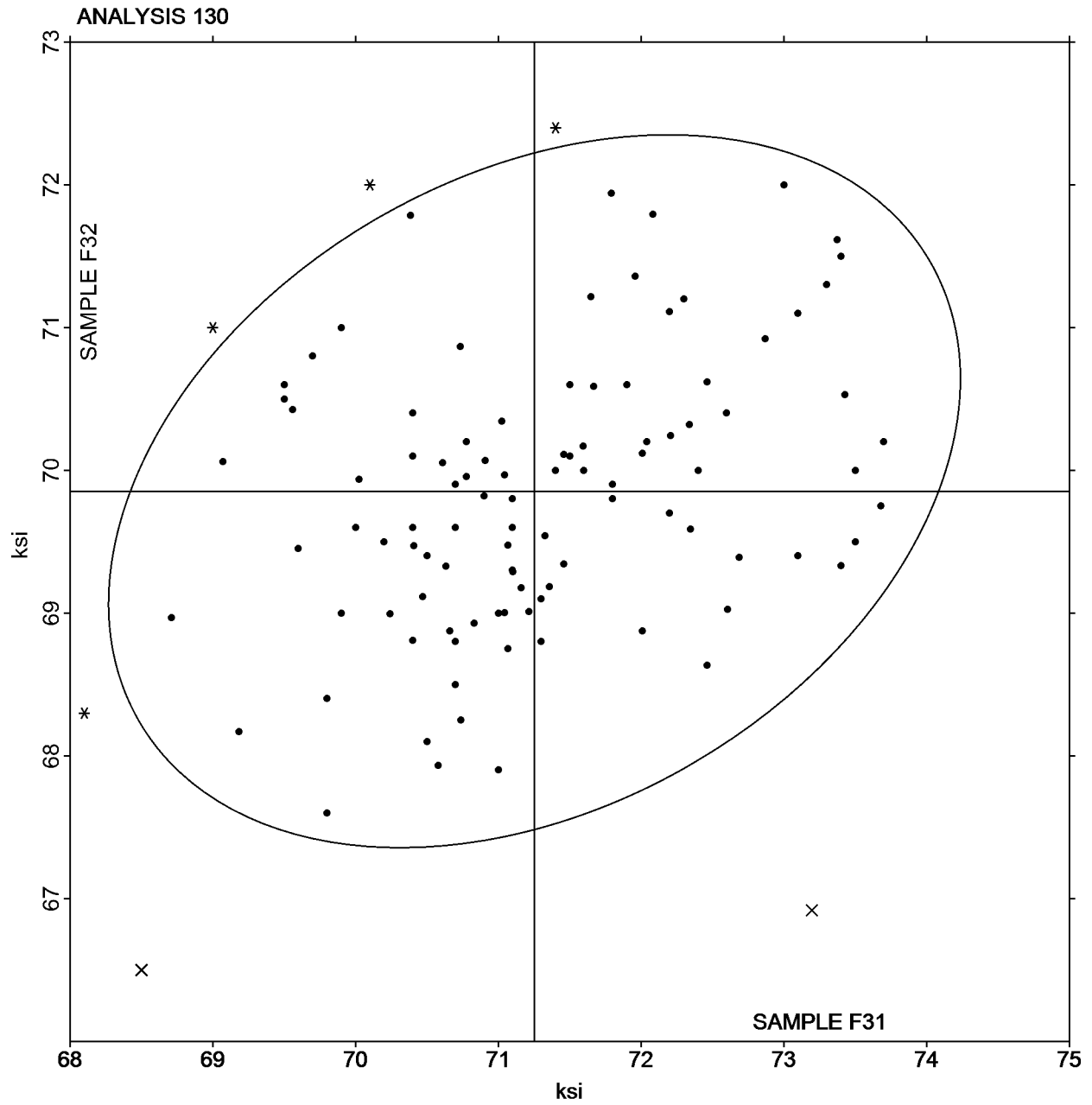
Tensile Strength (Flat Steel) - ksi
ASTM E8

SAMPLE F31

71.25 ksi

SAMPLE F32

69.85 ksi



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 131

Yield Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
272MGF		46.21	-0.62	-0.44	46.37	-0.22	-0.16	ZZ
3AU37E		46.85	0.02	0.01	46.14	-0.45	-0.33	ZZ
3H4G3P		48.10	1.27	0.90	48.50	1.91	1.41	ZZ
3PMM2G		49.60	2.77	1.96	49.75	3.16	2.32	ZZ
3RBEQT		46.24	-0.59	-0.42	46.70	0.11	0.08	ZZ
44368Q		45.40	-1.43	-1.01	44.96	-1.63	-1.20	ZZ
4C2K6B		47.50	0.67	0.47	45.06	-1.53	-1.12	ZZ
4H2AD3		46.20	-0.63	-0.45	47.20	0.61	0.45	ZZ
4MHEAC		47.86	1.03	0.73	46.40	-0.19	-0.14	ZZ
4XEHE7		46.90	0.07	0.05	46.40	-0.19	-0.14	ZZ
69X3L9		45.90	-0.93	-0.66	45.00	-1.59	-1.17	ZZ
768KGT		47.81	0.98	0.69	46.93	0.34	0.25	ZZ
8BAWB6		48.07	1.24	0.88	45.95	-0.64	-0.47	ZZ
9DYKBC		48.60	1.77	1.25	48.60	2.01	1.48	ZZ
9FHNTG	*	48.60	1.77	1.25	44.76	-1.83	-1.34	ZZ
9HRNZA		47.46	0.63	0.44	47.06	0.47	0.35	ZZ
9RWVEA		45.00	-1.83	-1.30	46.00	-0.59	-0.43	ZZ
A3NNG6		46.60	-0.23	-0.16	46.86	0.27	0.20	ZZ
AKAEDJ		44.95	-1.88	-1.33	45.02	-1.57	-1.15	ZZ
AQEZQG		46.50	-0.33	-0.23	46.80	0.21	0.16	ZZ
AWNHPA		45.40	-1.43	-1.01	44.90	-1.69	-1.24	ZZ
AY8JKV	*	45.89	-0.94	-0.67	49.06	2.47	1.82	ZZ
B34L9V		48.40	1.57	1.11	46.30	-0.29	-0.21	ZZ
B6UKNE		46.52	-0.32	-0.22	45.33	-1.26	-0.93	ZZ
BBDY2K		46.15	-0.69	-0.49	48.55	1.96	1.44	ZZ
BD7JF6		48.56	1.73	1.22	48.55	1.96	1.44	ZZ
BEHMLG		46.00	-0.83	-0.59	48.30	1.71	1.26	ZZ
BF8VQB		45.51	-1.32	-0.93	45.42	-1.17	-0.86	ZZ
BLY3AJ		45.62	-1.21	-0.86	47.24	0.65	0.48	ZZ
BN3QTF		47.53	0.70	0.49	46.31	-0.28	-0.20	ZZ
BY8U2J		47.60	0.77	0.54	46.09	-0.49	-0.36	ZZ
CBV64V		46.82	-0.01	-0.01	46.91	0.32	0.23	ZZ
CNMPRY		47.40	0.57	0.40	46.80	0.21	0.16	ZZ
CTGJPZ		47.52	0.69	0.49	47.86	1.27	0.93	ZZ
DAVP2H		48.69	1.86	1.31	46.13	-0.46	-0.34	ZZ
DFQAFZ		46.40	-0.43	-0.31	46.50	-0.09	-0.07	ZZ
DQH68Z		45.20	-1.63	-1.15	47.30	0.71	0.52	ZZ
DVYDTE		46.58	-0.26	-0.18	46.34	-0.25	-0.18	ZZ
ECPW9X		47.71	0.88	0.62	47.56	0.97	0.71	ZZ
EQZEXF		47.28	0.45	0.32	46.85	0.26	0.19	ZZ
EYCN8U		47.62	0.78	0.56	46.78	0.19	0.14	ZZ
F6XXWJ		46.20	-0.63	-0.45	46.50	-0.09	-0.07	ZZ
FMFW42		47.33	0.49	0.35	45.99	-0.60	-0.44	ZZ
FN7ZT3		47.34	0.51	0.36	46.15	-0.44	-0.32	ZZ
FWQYP3		48.65	1.81	1.28	46.35	-0.23	-0.17	ZZ
FXG67T		46.00	-0.83	-0.59	45.80	-0.79	-0.58	ZZ
FZ6T7Z		47.08	0.25	0.18	45.73	-0.86	-0.64	ZZ
G3LKQ2		46.73	-0.10	-0.07	47.10	0.51	0.37	ZZ
G9BXTA	*	43.30	-3.53	-2.50	44.70	-1.89	-1.39	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 131

Yield Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
GPKPUU		45.90	-0.93	-0.66	45.30	-1.29	-0.95	ZZ
H29BDU		49.31	2.48	1.75	49.75	3.16	2.32	ZZ
H2QB8J		46.01	-0.82	-0.58	46.58	-0.01	-0.01	ZZ
HBXWKD		47.00	0.17	0.12	48.00	1.41	1.04	ZZ
HLGDBY		47.05	0.22	0.15	46.10	-0.49	-0.36	ZZ
HZCUZX		45.69	-1.14	-0.81	45.54	-1.05	-0.77	ZZ
JGJBMP		46.30	-0.53	-0.38	46.00	-0.59	-0.43	ZZ
JH8W6E		50.20	3.37	2.38	49.20	2.61	1.92	ZZ
JK34ZD		46.12	-0.71	-0.50	45.79	-0.80	-0.59	ZZ
JTR444		44.30	-2.53	-1.79	45.30	-1.29	-0.95	ZZ
JWTXAL		46.11	-0.72	-0.51	47.10	0.51	0.37	ZZ
K87N69		46.90	0.07	0.05	47.70	1.11	0.82	ZZ
KE8Z27		48.10	1.27	0.90	45.30	-1.29	-0.95	ZZ
L7RC9P		47.40	0.57	0.40	46.20	-0.39	-0.29	ZZ
LGBVK9		45.18	-1.65	-1.17	45.79	-0.80	-0.59	ZZ
LXDNAG		46.70	-0.13	-0.09	45.90	-0.69	-0.51	ZZ
MH2L28		50.20	3.37	2.38	48.20	1.61	1.18	ZZ
MK8UH6		46.50	-0.33	-0.23	46.60	0.01	0.01	ZZ
MM7GK8		45.18	-1.65	-1.17	45.04	-1.55	-1.14	ZZ
N2A3PH	*	44.40	-2.43	-1.72	42.50	-4.09	-3.01	ZZ
N7K6W8		47.28	0.45	0.32	49.09	2.50	1.84	ZZ
NHEKJM		47.97	1.14	0.81	49.10	2.51	1.85	ZZ
NLYDXB		47.10	0.27	0.19	47.40	0.81	0.60	ZZ
P4V8XF		45.10	-1.73	-1.22	45.50	-1.09	-0.80	ZZ
P8BP34		46.70	-0.13	-0.09	46.20	-0.39	-0.29	ZZ
PNE9RE	*	42.80	-4.03	-2.85	44.10	-2.49	-1.83	ZZ
PQ4HXA		47.00	0.17	0.12	46.00	-0.59	-0.43	ZZ
Q9J68N		45.83	-1.00	-0.71	46.50	-0.09	-0.07	ZZ
QE64D4		48.08	1.25	0.89	48.40	1.81	1.33	ZZ
QGTTLM		46.50	-0.33	-0.23	48.10	1.51	1.11	ZZ
QYZNG3		46.40	-0.43	-0.31	45.90	-0.69	-0.51	ZZ
R2EU43		46.90	0.07	0.05	46.50	-0.09	-0.07	ZZ
R6ZCN9		46.20	-0.63	-0.45	45.20	-1.39	-1.02	ZZ
RRN9ZQ		48.15	1.32	0.93	47.40	0.81	0.60	ZZ
TFU3UY		45.30	-1.53	-1.08	46.00	-0.59	-0.43	ZZ
THYVKQ		48.60	1.77	1.25	46.90	0.31	0.23	ZZ
TTZ66U	*	43.32	-3.51	-2.48	43.50	-3.09	-2.27	ZZ
U3G9PY		44.73	-2.10	-1.48	44.64	-1.95	-1.43	ZZ
UCP7AW		46.56	-0.27	-0.19	48.59	2.00	1.47	ZZ
UR3ECL		48.10	1.27	0.90	47.10	0.51	0.38	ZZ
VEUQ23		45.62	-1.21	-0.86	43.84	-2.75	-2.02	ZZ
VNYU9L		47.89	1.06	0.75	46.97	0.38	0.28	ZZ
W6GCFC		47.00	0.17	0.12	46.50	-0.09	-0.07	ZZ
W79GNQ		43.50	-3.33	-2.36	44.50	-2.09	-1.54	ZZ
X9X7LC		50.19	3.36	2.37	48.03	1.44	1.06	ZZ
XKDNPG		47.92	1.09	0.77	49.14	2.55	1.88	ZZ
XMGJ9J		46.99	0.16	0.11	47.14	0.55	0.40	ZZ
XMV7J7		46.70	-0.13	-0.09	47.00	0.41	0.30	ZZ
XVRP32		47.50	0.67	0.47	45.70	-0.89	-0.65	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 131

Yield Strength (Flat Steel) - ksi
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
Y38VAT		47.50	0.67	0.47	47.50	0.91	0.67	ZZ
Y4HV99		47.20	0.37	0.26	47.30	0.71	0.52	ZZ
Y4Y3HW		47.52	0.69	0.49	45.76	-0.83	-0.61	ZZ
YDL4WK		48.30	1.47	1.04	47.00	0.41	0.30	ZZ
YN86EF		46.56	-0.27	-0.19	45.69	-0.90	-0.66	ZZ
YV2EFX		46.30	-0.53	-0.38	46.20	-0.39	-0.29	ZZ
Z4CZ38		47.90	1.07	0.76	47.80	1.21	0.89	ZZ
ZZYZ6F		49.00	2.17	1.53	48.50	1.91	1.41	ZZ

Summary Statistics

	Sample F31		Sample F32	
Grand Means	46.83	ksi	46.59	ksi
Std Dev Btwn Labs	1.41	ksi	1.36	ksi

Samples F31 , F32 : AISI 1010 - 16G , AISI 1010 - 14G

Statistics based on 106 of 106 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 131

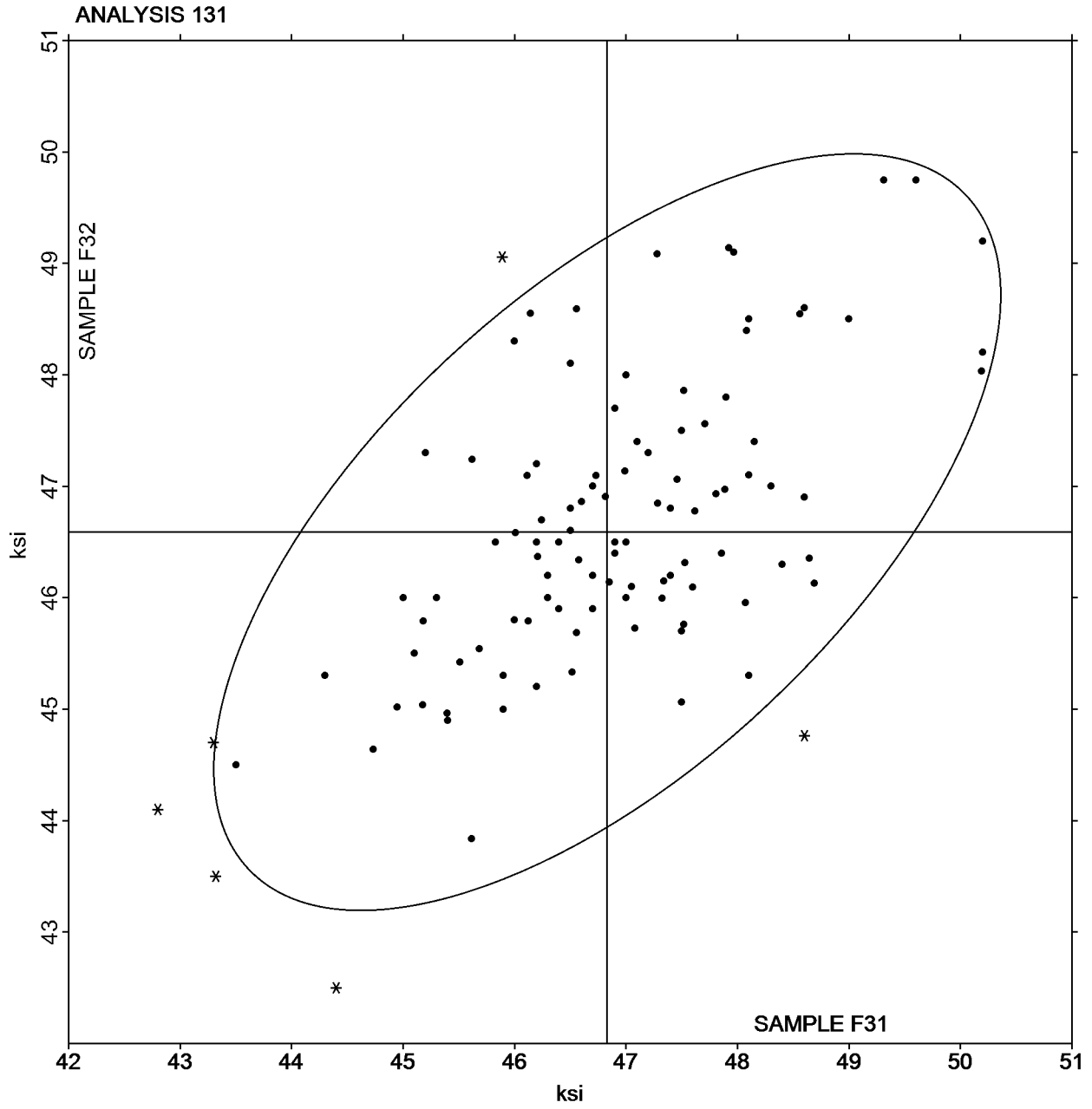
Yield Strength (Flat Steel) - ksi
ASTM E8

SAMPLE F31

46.83 ksi

SAMPLE F32

46.59 ksi



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 132

Elongation (Flat Steel) - Percent Increase
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
272MGF		27.90	-0.64	-0.32	27.50	-0.65	-0.34	ZZ
3AU37E		27.58	-0.96	-0.48	27.82	-0.33	-0.17	ZZ
3H4G3P		28.00	-0.54	-0.27	28.00	-0.15	-0.08	ZZ
3PMM2G		24.01	-4.53	-2.25	24.04	-4.11	-2.13	ZZ
3RBEQT		29.00	0.46	0.23	28.00	-0.15	-0.08	ZZ
44368Q		31.00	2.46	1.22	31.00	2.85	1.48	ZZ
4C2K6B		26.70	-1.84	-0.92	26.50	-1.65	-0.86	ZZ
4H2AD3		29.40	0.86	0.43	29.80	1.65	0.86	ZZ
4MHEAC		29.70	1.16	0.58	29.40	1.25	0.65	ZZ
4XEHE7		27.10	-1.44	-0.72	27.00	-1.15	-0.60	ZZ
69X3L9		30.80	2.26	1.12	30.20	2.05	1.06	ZZ
768KGT		29.60	1.06	0.53	29.20	1.05	0.54	ZZ
8BAWB6		25.50	-3.04	-1.51	27.00	-1.15	-0.60	ZZ
9DYKBC		27.00	-1.54	-0.77	26.00	-2.15	-1.12	ZZ
9FHNTG	X	41.00	12.46	6.19	39.66	11.51	5.97	ZZ
9HRNZA		28.12	-0.42	-0.21	27.36	-0.79	-0.41	ZZ
9RWVEA	*	25.30	-3.24	-1.61	23.50	-4.65	-2.41	ZZ
A3NNG6		27.80	-0.74	-0.37	26.60	-1.55	-0.80	ZZ
AKAEDJ		29.87	1.33	0.66	28.69	0.54	0.28	ZZ
AQEZQG		28.40	-0.14	-0.07	28.60	0.45	0.23	ZZ
AWNHPA		30.50	1.96	0.97	30.00	1.85	0.96	ZZ
AY8JKV		30.06	1.52	0.75	28.44	0.29	0.15	ZZ
B34L9V		27.00	-1.54	-0.77	26.00	-2.15	-1.12	ZZ
B6UKNE		30.50	1.96	0.97	30.00	1.85	0.96	ZZ
BBDY2K		31.00	2.46	1.22	30.00	1.85	0.96	ZZ
BD7JF6		26.00	-2.54	-1.26	27.10	-1.05	-0.55	ZZ
BEHMLG		31.50	2.96	1.47	28.90	0.75	0.39	ZZ
BF8VQB		29.15	0.61	0.30	30.20	2.05	1.06	ZZ
BLY3AJ		31.50	2.96	1.47	30.20	2.05	1.06	ZZ
BN3QTF		24.69	-3.85	-1.91	24.17	-3.98	-2.07	ZZ
BY8U2J	X	29.10	0.56	0.28	34.20	6.05	3.14	ZZ
CBV64V		26.60	-1.94	-0.96	25.30	-2.85	-1.48	ZZ
CNMPRY		30.30	1.76	0.87	28.40	0.25	0.13	ZZ
CTGJPZ		32.50	3.96	1.97	30.50	2.35	1.22	ZZ
D2K3FA	*	29.15	0.61	0.30	31.25	3.10	1.61	ZZ
DAVP2H	*	34.47	5.93	2.95	32.24	4.09	2.12	ZZ
DFQAFZ	*	34.00	5.46	2.71	33.00	4.85	2.52	ZZ
DQH68Z		28.00	-0.54	-0.27	28.00	-0.15	-0.08	ZZ
DVYDTE		25.68	-2.86	-1.42	25.57	-2.58	-1.34	ZZ
ECPW9X		32.50	3.96	1.97	31.50	3.35	1.74	ZZ
EQZEXF		29.00	0.46	0.23	29.00	0.85	0.44	ZZ
EYCN8U		26.52	-2.02	-1.00	25.92	-2.23	-1.16	ZZ
F6XXWJ		28.90	0.36	0.18	27.10	-1.05	-0.55	ZZ
FMFW42		28.90	0.36	0.18	29.00	0.85	0.44	ZZ
FN7ZT3		28.51	-0.03	-0.02	27.76	-0.39	-0.20	ZZ
FQTQU8		23.60	-4.94	-2.46	24.12	-4.03	-2.09	ZZ
FWQYP3		27.40	-1.14	-0.57	28.90	0.75	0.39	ZZ
FXG67T		26.40	-2.14	-1.06	26.66	-1.49	-0.77	ZZ
FZ6T7Z		29.30	0.76	0.38	29.40	1.25	0.65	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 132

Elongation (Flat Steel) - Percent Increase
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
G3LKQ2		27.23	-1.31	-0.65	26.29	-1.86	-0.97	ZZ
G9BXTA		26.50	-2.04	-1.01	26.00	-2.15	-1.12	ZZ
GPKPUU		27.10	-1.44	-0.72	27.00	-1.15	-0.60	ZZ
H29BDU		27.00	-1.54	-0.77	29.00	0.85	0.44	ZZ
H2QB8J		29.98	1.44	0.72	28.28	0.13	0.07	ZZ
HBXWKD		27.00	-1.54	-0.77	26.90	-1.25	-0.65	ZZ
HLGDBY		27.28	-1.26	-0.63	27.12	-1.03	-0.53	ZZ
HZCUZX		27.00	-1.54	-0.77	26.00	-2.15	-1.12	ZZ
JGJBMP		27.50	-1.04	-0.52	28.50	0.35	0.18	ZZ
JH8W6E		26.10	-2.44	-1.21	24.60	-3.55	-1.84	ZZ
JK34ZD		28.00	-0.54	-0.27	26.70	-1.45	-0.75	ZZ
JRWK23		27.07	-1.47	-0.73	26.03	-2.12	-1.10	ZZ
JTR444		28.00	-0.54	-0.27	28.00	-0.15	-0.08	ZZ
JWTXAL		29.00	0.46	0.23	28.00	-0.15	-0.08	ZZ
K87N69		28.50	-0.04	-0.02	27.70	-0.45	-0.23	ZZ
KE8Z27		26.30	-2.24	-1.11	28.40	0.25	0.13	ZZ
L7RC9P		30.10	1.56	0.77	29.50	1.35	0.70	ZZ
LGBVK9		27.57	-0.97	-0.48	27.77	-0.38	-0.20	ZZ
LXDNAG		27.40	-1.14	-0.57	27.30	-0.85	-0.44	ZZ
MH2L28		29.30	0.76	0.38	28.60	0.45	0.23	ZZ
MK8UH6		29.00	0.46	0.23	27.50	-0.65	-0.34	ZZ
MM7GK8		31.69	3.15	1.57	32.00	3.85	2.00	ZZ
N2A3PH		29.00	0.46	0.23	29.00	0.85	0.44	ZZ
N7K6W8		27.00	-1.54	-0.77	25.40	-2.75	-1.43	ZZ
NHEKJM	*	32.50	3.96	1.97	29.50	1.35	0.70	ZZ
NLYDXB		30.70	2.16	1.07	29.80	1.65	0.86	ZZ
P4V8XF		29.10	0.56	0.28	28.20	0.05	0.03	ZZ
P8BP34		26.50	-2.04	-1.01	26.10	-2.05	-1.06	ZZ
PNE9RE	X	31.80	3.26	1.62	23.50	-4.65	-2.41	ZZ
PQ4HXA		27.70	-0.84	-0.42	25.70	-2.45	-1.27	ZZ
Q9J68N		26.20	-2.34	-1.16	25.79	-2.36	-1.22	ZZ
QE64D4		29.00	0.46	0.23	28.40	0.25	0.13	ZZ
QGTTLM	*	29.20	0.66	0.33	26.20	-1.95	-1.01	ZZ
QYZNG3		28.45	-0.09	-0.05	27.50	-0.65	-0.34	ZZ
R2EU43		28.30	-0.24	-0.12	28.60	0.45	0.23	ZZ
R6ZCN9		30.00	1.46	0.73	29.50	1.35	0.70	ZZ
RRN9ZQ		25.30	-3.24	-1.61	25.50	-2.65	-1.38	ZZ
TFU3UY		31.20	2.66	1.32	31.70	3.55	1.84	ZZ
THYVKQ		26.80	-1.74	-0.87	26.90	-1.25	-0.65	ZZ
TTZ66U		30.21	1.67	0.83	31.12	2.97	1.54	ZZ
U3G9PY		30.06	1.52	0.76	28.59	0.44	0.23	ZZ
UCP7AW		27.93	-0.61	-0.30	27.99	-0.16	-0.08	ZZ
UR3ECL		29.00	0.46	0.23	30.00	1.85	0.96	ZZ
VEUQ23		28.90	0.36	0.18	30.50	2.35	1.22	ZZ
VNYU9L		29.30	0.76	0.38	29.50	1.35	0.70	ZZ
W6GCFC		30.10	1.56	0.77	31.10	2.95	1.53	ZZ
W79GNQ	X	32.60	4.06	2.02	35.80	7.65	3.97	ZZ
X9X7LC		27.75	-0.79	-0.39	26.80	-1.35	-0.70	ZZ
XKDNPG		30.40	1.86	0.92	30.60	2.45	1.27	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 132

Elongation (Flat Steel) - Percent Increase
ASTM E8

WebCode	Data Flag	Sample F31			Sample F32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XMGJ9J		28.30	-0.24	-0.12	27.80	-0.35	-0.18	ZZ
XMV7J7	X	26.50	-2.04	-1.01	29.60	1.45	0.75	ZZ
XVRP32		27.60	-0.94	-0.47	27.90	-0.25	-0.13	ZZ
Y38VAT		26.60	-1.94	-0.96	27.40	-0.75	-0.39	ZZ
Y4HV99		29.60	1.06	0.53	28.40	0.25	0.13	ZZ
Y4Y3HW	X	29.10	0.56	0.28	32.70	4.55	2.36	ZZ
YDL4WK		26.90	-1.64	-0.82	27.80	-0.35	-0.18	ZZ
YN86EF		29.10	0.56	0.28	29.20	1.05	0.54	ZZ
YV2EFX		32.10	3.56	1.77	30.60	2.45	1.27	ZZ
Z4CZ38		29.20	0.66	0.33	29.50	1.35	0.70	ZZ
ZZYZ6F		28.70	0.16	0.08	28.90	0.75	0.39	ZZ

Summary Statistics

	Sample F31		Sample F32	
Grand Means	28.54	Percent	28.15	Percent
Std Dev Btwn Labs	2.01	Percent	1.93	Percent

Samples F31 , F32 : AISI 1010 - 16G , AISI 1010 - 14G

Statistics based on 103 of 109 reporting participants

Comments on assigned Data Flags for Analysis #132

WebCode Flag Analyst Comment

9FHNTG X Data for both samples are high. Possible Systematic error.

BY8U2J X Data for sample F32 are high. Inconsistent in testing between samples.

PNE9RE X Inconsistent in testing between samples.

W79GNQ X Data for sample F32 are high. Inconsistent in testing between samples.

XMV7J7 X Inconsistent in testing between samples.

Y4Y3HW X Inconsistent in testing between samples.

Cycle 112
4th Q, 2015

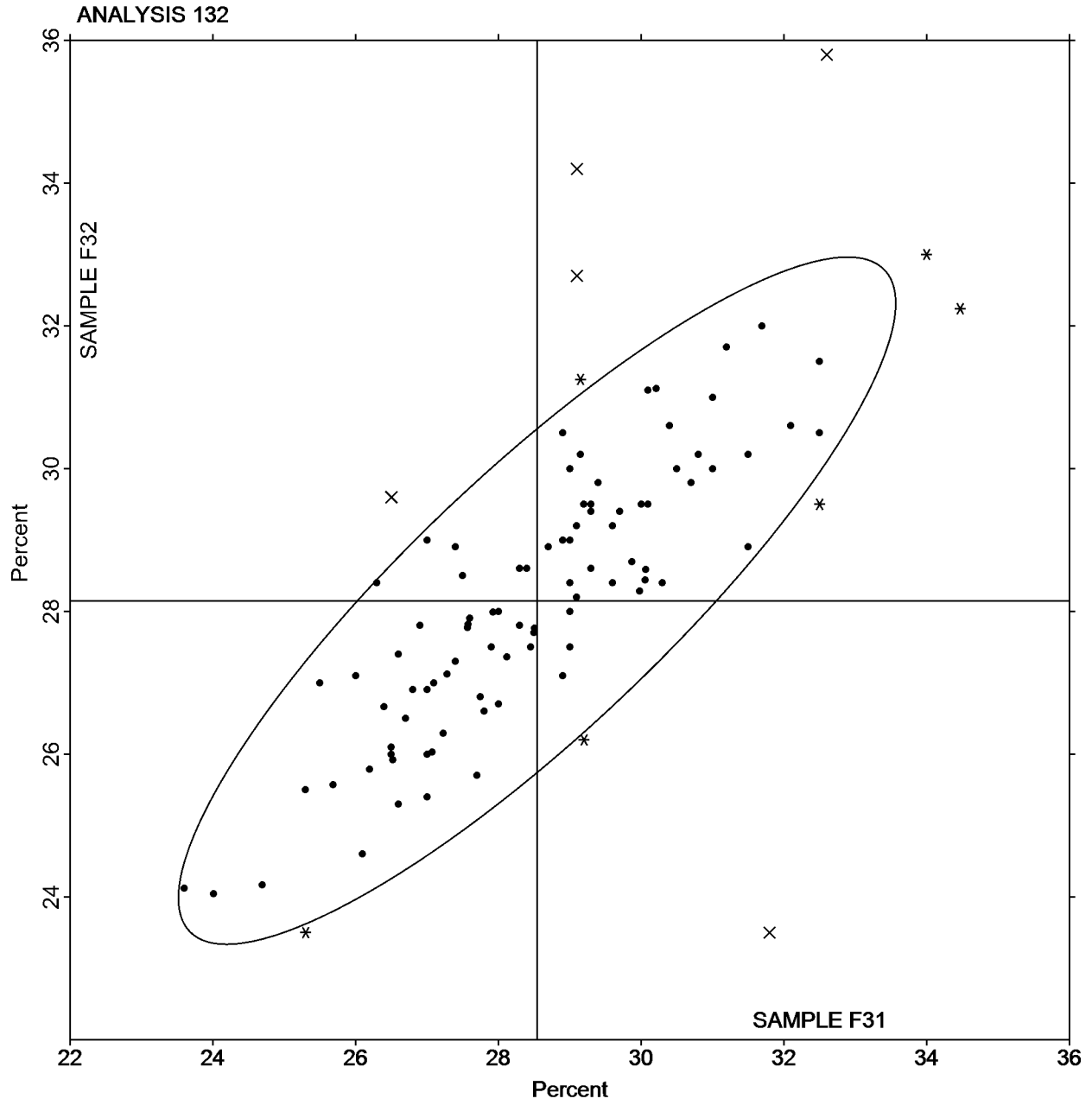
Interlaboratory Testing Program for Metals

Analysis 132

Elongation (Flat Steel) - Percent Increase
ASTM E8

SAMPLE F31
28.54 Percent

SAMPLE F32
28.15 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 136
Rockwell Superficial Hardness (30N Scale)
ASTM E18

WebCode	Data Flag	Sample E31			Sample E32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23W49L		75.75	0.18	0.29	71.22	0.06	0.12	ZZ
2KW2GA		75.50	-0.08	-0.12	71.54	0.39	0.74	ZZ
2ZBEQU		75.76	0.18	0.29	71.68	0.53	1.01	ZZ
39YK6D		75.64	0.06	0.10	71.22	0.07	0.13	ZZ
3FE9WU		75.20	-0.38	-0.60	70.18	-0.97	-1.88	ZZ
3U6VDN		76.00	0.42	0.68	71.22	0.07	0.13	ZZ
4R9Y2Y		75.78	0.20	0.33	71.42	0.27	0.51	ZZ
4XEHE7		74.86	-0.72	-1.15	70.16	-0.99	-1.92	ZZ
4YAZF8		75.52	-0.06	-0.09	71.08	-0.07	-0.14	ZZ
6A34X7		75.32	-0.26	-0.41	71.16	0.01	0.01	ZZ
7U8WPW		76.08	0.50	0.81	71.76	0.61	1.17	ZZ
8BVCHV		75.56	-0.02	-0.03	71.08	-0.07	-0.14	ZZ
8C4QP2		76.18	0.60	0.97	71.80	0.65	1.24	ZZ
8DFEBL		74.70	-0.88	-1.41	70.46	-0.69	-1.34	ZZ
8ZRCQ9		75.16	-0.42	-0.67	70.38	-0.77	-1.49	ZZ
9RWVEA		76.48	0.90	1.45	71.92	0.77	1.47	ZZ
ACTWW6		76.44	0.86	1.39	71.68	0.53	1.01	ZZ
AW78AP		76.92	1.34	2.16	72.16	1.01	1.94	ZZ
B34L9V	X	73.90	-1.68	-2.69	69.06	-2.09	-4.04	ZZ
B38VfV	*	74.40	-1.18	-1.89	71.14	-0.01	-0.03	ZZ
BR7H7M		75.90	0.32	0.52	71.82	0.67	1.28	ZZ
CNJ8LN		74.14	-1.44	-2.30	70.50	-0.65	-1.26	ZZ
CVNYR		74.96	-0.62	-0.99	70.42	-0.73	-1.42	ZZ
CWY2MC		74.44	-1.14	-1.82	70.42	-0.73	-1.42	ZZ
CZELJY		76.06	0.48	0.78	71.22	0.07	0.13	ZZ
D6LE22		76.26	0.68	1.10	72.14	0.99	1.90	ZZ
DU4MPK		76.16	0.58	0.94	71.24	0.09	0.16	ZZ
EJJTYA		76.64	1.06	1.71	72.00	0.85	1.63	ZZ
EREV2L		76.14	0.56	0.90	71.00	-0.15	-0.30	ZZ
EWBDF2		75.00	-0.58	-0.92	71.00	-0.15	-0.30	ZZ
FGWCGP	X	57.88	-17.70	-28.38	52.54	-18.61	-35.88	ZZ
FJZ7Y8		75.26	-0.32	-0.51	71.08	-0.07	-0.14	ZZ
GFAA2Z		76.04	0.46	0.74	71.20	0.05	0.09	ZZ
GJ9X7E		75.44	-0.14	-0.22	71.06	-0.09	-0.18	ZZ
HHWBH9		75.60	0.02	0.04	70.88	-0.27	-0.53	ZZ
J32FBZ		75.70	0.12	0.20	70.70	-0.45	-0.88	ZZ
JH8W6E		75.88	0.30	0.49	71.44	0.29	0.55	ZZ
M8LH7V		75.48	-0.10	-0.15	70.82	-0.33	-0.65	ZZ
MGNZFC	*	73.80	-1.78	-2.85	70.20	-0.95	-1.84	ZZ
MJD4CQ		75.30	-0.28	-0.44	70.96	-0.19	-0.38	ZZ
MK8UH6		75.00	-0.58	-0.92	71.00	-0.15	-0.30	ZZ
MQRY6D		74.98	-0.60	-0.96	71.20	0.05	0.09	ZZ
MUWHD8		75.30	-0.28	-0.44	71.60	0.45	0.86	ZZ
MY7YMV		75.74	0.16	0.26	71.12	-0.03	-0.07	ZZ
P4V8XF		75.72	0.14	0.23	71.42	0.27	0.51	ZZ
QAVUDL		75.66	0.08	0.13	71.08	-0.07	-0.14	ZZ
QUJCD8		74.48	-1.10	-1.76	70.82	-0.33	-0.65	ZZ
RQX3JZ	X	76.90	1.32	2.12	70.46	-0.69	-1.34	ZZ
TM9XML		76.16	0.58	0.94	72.18	1.03	1.98	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 136

Rockwell Superficial Hardness (30N Scale)

ASTM E18

WebCode	Data Flag	Sample E31			Sample E32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
U97YXF		75.30	-0.28	-0.44	70.64	-0.51	-0.99	ZZ
V7FA32		76.22	0.64	1.03	72.00	0.85	1.63	ZZ
VLTCAP		75.52	-0.06	-0.09	71.10	-0.05	-0.11	ZZ
W86XY2		75.62	0.04	0.07	70.64	-0.51	-0.99	ZZ
WNFEAB	X	74.14	-1.44	-2.30	69.32	-1.83	-3.54	ZZ
X2YJWX		75.62	0.04	0.07	70.84	-0.31	-0.61	ZZ
XDQ2UB		76.44	0.86	1.39	71.60	0.45	0.86	ZZ
XEKV98		75.96	0.38	0.62	71.40	0.25	0.47	ZZ
Y2UAQH		75.86	0.28	0.46	71.26	0.11	0.20	ZZ
Y6UKHC		75.66	0.08	0.13	71.34	0.19	0.36	ZZ
ZHVGEJ		76.12	0.54	0.87	70.98	-0.17	-0.34	ZZ
ZLWHHM		74.99	-0.59	-0.94	70.22	-0.93	-1.79	ZZ
ZV3L7W		75.62	0.04	0.07	71.18	0.03	0.05	ZZ

Summary Statistics

	Sample E31		Sample E32	
Grand Means	75.58	HR30N	71.15	HR30N
Std Dev Btwn Labs	0.62	HR30N	0.52	HR30N

Samples E31 , E32 : Steel

Statistics based on 58 of 62 reporting participants

Comments on assigned Data Flags for Analysis #136

WebCode Flag Analyst Comment

B34L9V X Data for sample E32 are low. Inconsistent within the determinations of both samples.

FGWCGP X Data for both samples are low.

RQX3JZ X Inconsistent in testing between samples. Inconsistent within the determinations of sample E32.

WNFEAB X Data for sample E32 are low. Inconsistent within the determinations of sample E31.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

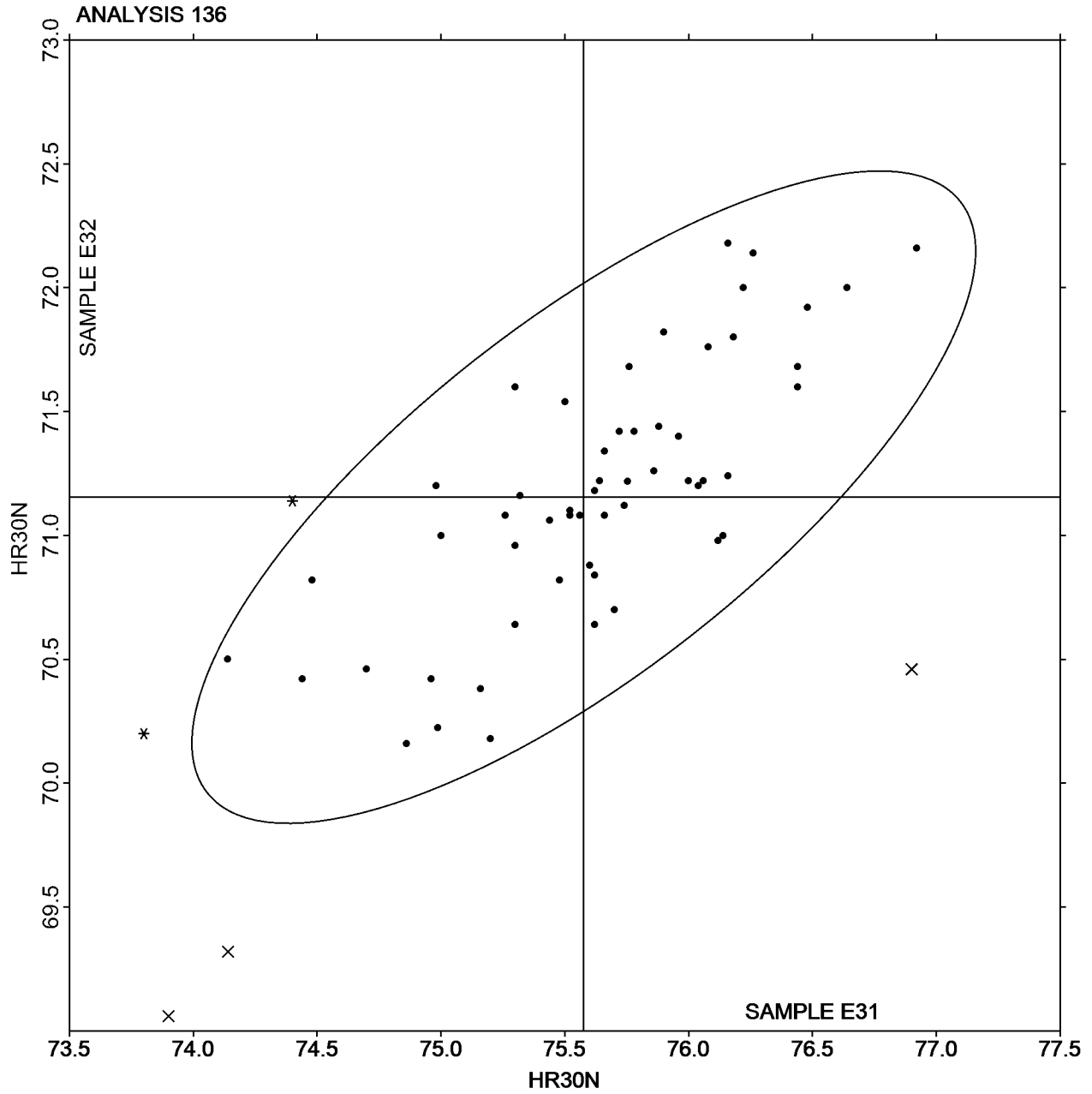
Analysis 136

Rockwell Superficial Hardness (30N Scale)

ASTM E18

SAMPLE E31
75.58 HR30N

SAMPLE E32
71.15 HR30N



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 145

Total Case Depth - inches
SAE J423, SAE J78

WebCode	Data Flag	Sample C31			Sample C32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23W49L		0.0198	0.0031	1.01	0.0320	0.0030	0.70	ZZ
392YRL		0.0177	0.0010	0.33	0.0308	0.0018	0.42	ZZ
3FE9WU		0.0131	-0.0036	-1.17	0.0260	-0.0030	-0.70	ZZ
3H7CLV		0.0194	0.0027	0.87	0.0350	0.0059	1.39	ZZ
3U6VDN		0.0159	-0.0008	-0.27	0.0281	-0.0009	-0.21	ZZ
3WNNW9A		0.0163	-0.0004	-0.13	0.0270	-0.0020	-0.47	ZZ
3YQW7L		0.0213	0.0046	1.49	0.0346	0.0056	1.32	ZZ
4B636U		0.0102	-0.0065	-2.13	0.0208	-0.0082	-1.93	ZZ
4VVGJJ		0.0180	0.0013	0.43	0.0306	0.0016	0.37	ZZ
4YAZF8		0.0167	0.0000	-0.01	0.0285	-0.0005	-0.12	ZZ
6Z44TE		0.0168	0.0001	0.03	0.0307	0.0017	0.40	ZZ
734RPF		0.0198	0.0031	1.03	0.0320	0.0029	0.69	ZZ
9YD68C		0.0140	-0.0027	-0.89	0.0253	-0.0037	-0.87	ZZ
AMV6NN		0.0141	-0.0026	-0.85	0.0275	-0.0015	-0.36	ZZ
AQEZQG		0.0149	-0.0018	-0.58	0.0231	-0.0059	-1.39	ZZ
AW78AP		0.0116	-0.0051	-1.65	0.0221	-0.0069	-1.62	ZZ
B34L9V		0.0195	0.0028	0.92	0.0334	0.0044	1.03	ZZ
B6UKNE		0.0170	0.0003	0.10	0.0300	0.0010	0.23	ZZ
BR7H7M		0.0141	-0.0026	-0.83	0.0256	-0.0034	-0.81	ZZ
CK7H7K		0.0128	-0.0039	-1.27	0.0232	-0.0058	-1.37	ZZ
CVN2NW		0.0168	0.0001	0.03	0.0297	0.0007	0.17	ZZ
CVNYR		0.0163	-0.0004	-0.12	0.0298	0.0008	0.19	ZZ
CZELJY		0.0155	-0.0012	-0.39	0.0293	0.0003	0.07	ZZ
DAVP2H		0.0152	-0.0015	-0.48	0.0292	0.0002	0.04	ZZ
DNEANX		0.0175	0.0008	0.28	0.0325	0.0035	0.83	ZZ
EVZDJ7		0.0171	0.0004	0.12	0.0257	-0.0033	-0.78	ZZ
FBMBX7		0.0195	0.0028	0.91	0.0301	0.0011	0.26	ZZ
G3NWPQ		0.0192	0.0025	0.82	0.0312	0.0022	0.51	ZZ
G9BXTA		0.0191	0.0024	0.79	0.0333	0.0043	1.01	ZZ
GJ9X7E		0.0145	-0.0022	-0.72	0.0255	-0.0035	-0.83	ZZ
H6R3QH		0.0190	0.0023	0.75	0.0310	0.0020	0.46	ZZ
J96C7T		0.0121	-0.0046	-1.48	0.0231	-0.0059	-1.39	ZZ
K87N69		0.0227	0.0060	1.96	0.0379	0.0089	2.08	ZZ
KFHMYK		0.0125	-0.0042	-1.36	0.0254	-0.0036	-0.85	ZZ
LTN7XQ		0.0182	0.0015	0.49	0.0309	0.0019	0.45	ZZ
MFGK97		0.0187	0.0020	0.65	0.0313	0.0023	0.54	ZZ
MK8UH6		0.0188	0.0021	0.68	0.0299	0.0008	0.20	ZZ
MQRY6D		0.0130	-0.0037	-1.20	0.0240	-0.0050	-1.18	ZZ
MT6MQY	*	0.0239	0.0072	2.35	0.0357	0.0067	1.57	ZZ
NXP3UV		0.0170	0.0003	0.11	0.0279	-0.0012	-0.27	ZZ
P32CJJ		0.0170	0.0003	0.10	0.0312	0.0022	0.51	ZZ
QABAF2		0.0169	0.0002	0.07	0.0306	0.0016	0.37	ZZ
QQJCZV		0.0160	-0.0007	-0.23	0.0248	-0.0042	-0.99	ZZ
QUJCD8	X	0.0172	0.0005	0.16	0.3180	0.2890	67.84	ZZ
QZAX8E		0.0176	0.0009	0.29	0.0266	-0.0024	-0.56	ZZ
R6E6Y3		0.0124	-0.0043	-1.40	0.0218	-0.0072	-1.70	ZZ
RRN9ZQ		0.0207	0.0040	1.31	0.0340	0.0050	1.17	ZZ
TM9XML		0.0191	0.0024	0.77	0.0345	0.0054	1.28	ZZ
WPLW97		0.0174	0.0007	0.23	0.0324	0.0034	0.79	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 145

Total Case Depth - inches
SAE J423, SAE J78

WebCode	Data Flag	Sample C31			Sample C32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
WZ7YYE	*	0.00890	-0.0078	-2.54	0.0183	-0.0107	-2.51	ZZ
X6FNT8		0.0181	0.0014	0.44	0.0323	0.0033	0.77	ZZ
XDQ2UB		0.0178	0.0011	0.36	0.0336	0.0046	1.07	ZZ

Summary Statistics				
	Sample C31		Sample C32	
Grand Means	0.0167	inches	0.0290	inches
Std Dev Btwn Labs	0.0031	inches	0.0043	inches

Samples C31 , C32 : Steel

Statistics based on 51 of 52 reporting participants

Comments on assigned Data Flags for Analysis #145

WebCode Flag Analyst Comment

QUJCD8 X Data for sample C32 are high. Inconsistent within the determinations of sample C32.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

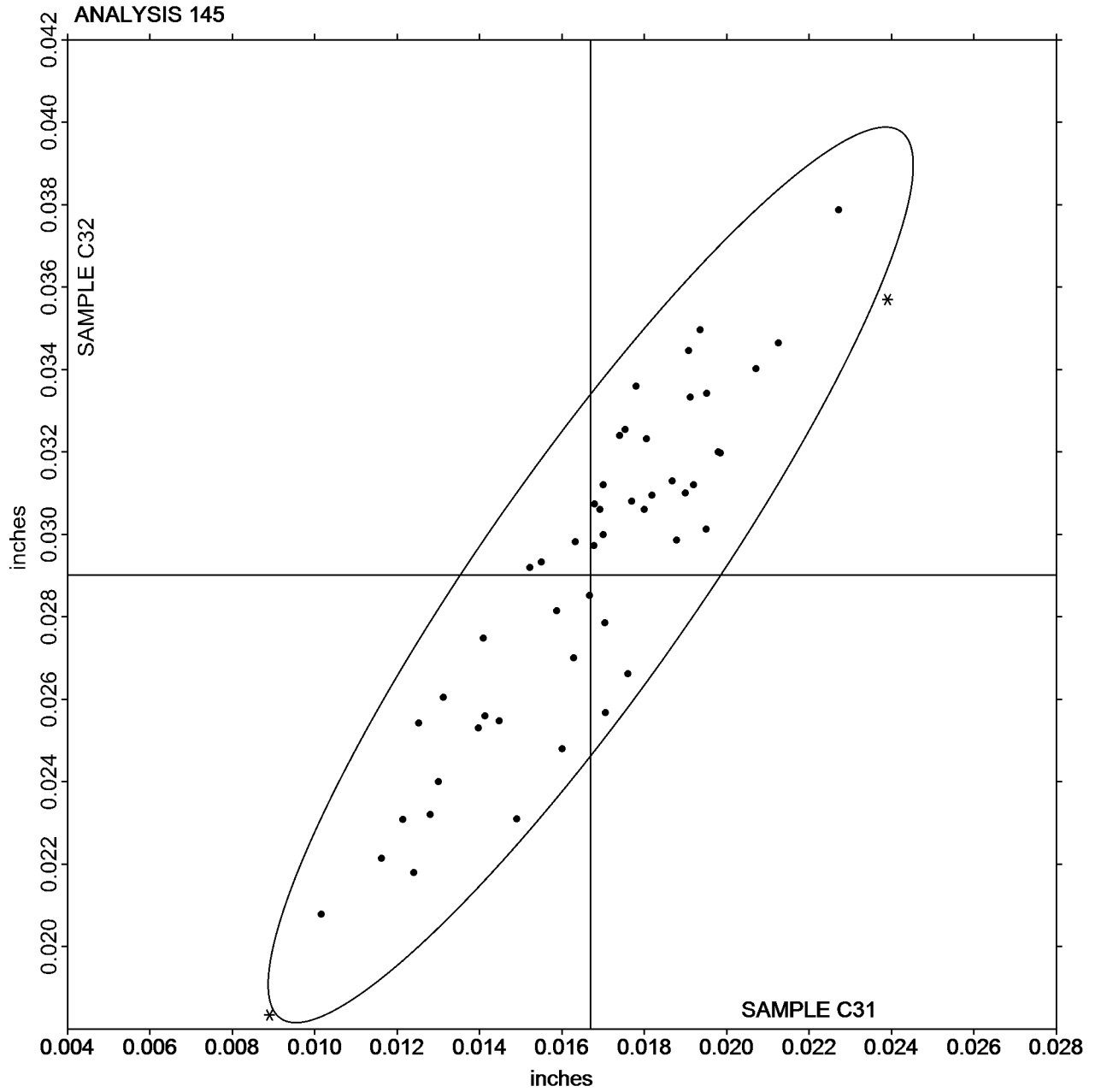
Analysis 145

Total Case Depth - inches

SAE J423, SAE J78

SAMPLE C31
0.0167 inches

SAMPLE C32
0.0290 inches



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 146

Effective Case Depth - inches
SAE J423, SAE J78

WebCode	Data Flag	Sample C31			Sample C32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
23W49L		0.0168	0.0013	1.01	0.0283	0.0011	0.51	ZZ
2DYC3Q		0.0147	-0.0007	-0.55	0.0261	-0.0012	-0.57	ZZ
392YRL		0.0154	-0.0001	-0.04	0.0276	0.0004	0.17	ZZ
3FE9WU		0.0133	-0.0022	-1.63	0.0270	-0.0002	-0.11	ZZ
3H7CLV		0.0165	0.0010	0.76	0.0294	0.0021	1.03	ZZ
3U6VDN		0.0145	-0.0009	-0.69	0.0248	-0.0024	-1.18	ZZ
3YQW7L		0.0156	0.0001	0.10	0.0257	-0.0015	-0.73	ZZ
4B636U		0.0134	-0.0021	-1.55	0.0269	-0.0004	-0.19	ZZ
4RBLHC		0.0136	-0.0019	-1.39	0.0244	-0.0028	-1.38	ZZ
4VVGJJ		0.0154	-0.0001	-0.04	0.0236	-0.0036	-1.77	ZZ
4YAZF8	X	0.0167	0.0012	0.92	0.0170	-0.0102	-4.95	ZZ
6GPKZH		0.0148	-0.0007	-0.52	0.0292	0.0019	0.93	ZZ
6Z44TE		0.0169	0.0014	1.08	0.0288	0.0016	0.76	ZZ
734RPF		0.0179	0.0024	1.82	0.0287	0.0014	0.68	ZZ
9BMUX2		0.0152	-0.0002	-0.17	0.0283	0.0010	0.49	ZZ
9YD68C		0.0175	0.0021	1.56	0.0301	0.0028	1.38	ZZ
AMV6NN		0.0149	-0.0005	-0.40	0.0287	0.0014	0.70	ZZ
AQEZQG	X	0.0167	0.0012	0.94	0.0228	-0.0044	-2.15	ZZ
B34L9V		0.0168	0.0013	1.01	0.0274	0.0002	0.07	ZZ
B6UKNE		0.0132	-0.0023	-1.69	0.0256	-0.0016	-0.80	ZZ
BR7H7M		0.0141	-0.0014	-1.05	0.0255	-0.0018	-0.86	ZZ
CK7H7K		0.0126	-0.0029	-2.14	0.0240	-0.0032	-1.57	ZZ
CVN2NW		0.0158	0.0003	0.25	0.0282	0.0009	0.44	ZZ
CVNYR		0.0160	0.0005	0.41	0.0282	0.0010	0.46	ZZ
CZELJY		0.0159	0.0005	0.34	0.0290	0.0018	0.87	ZZ
D3YPRW		0.0149	-0.0006	-0.43	0.0261	-0.0012	-0.57	ZZ
DAVP2H		0.0169	0.0015	1.12	0.0259	-0.0013	-0.65	ZZ
DNEANX		0.0154	-0.0001	-0.04	0.0280	0.0008	0.36	ZZ
EVZDJ7		0.0164	0.0009	0.68	0.0256	-0.0016	-0.78	ZZ
EZKMFH		0.0162	0.0007	0.56	0.0294	0.0022	1.04	ZZ
F6XXWJ		0.0148	-0.0007	-0.49	0.0254	-0.0018	-0.90	ZZ
FXG67T		0.0154	-0.0001	-0.04	0.0278	0.0006	0.27	ZZ
G3NWPQ		0.0142	-0.0013	-0.94	0.0232	-0.0040	-1.96	ZZ
G9BXTA		0.0152	-0.0003	-0.19	0.0300	0.0028	1.33	ZZ
GJ9X7E		0.0132	-0.0023	-1.69	0.0270	-0.0002	-0.12	ZZ
H6R3QH		0.0166	0.0012	0.89	0.0282	0.0009	0.44	ZZ
J96C7T		0.0154	-0.0001	-0.04	0.0282	0.0010	0.48	ZZ
K87N69	*	0.0126	-0.0029	-2.14	0.0210	-0.0062	-3.02	ZZ
KFHMYK		0.0150	-0.0005	-0.34	0.0284	0.0012	0.56	ZZ
LTN7XQ		0.0161	0.0007	0.52	0.0287	0.0015	0.72	ZZ
MFGK97		0.0149	-0.0006	-0.41	0.0250	-0.0022	-1.09	ZZ
MK8UH6		0.0172	0.0018	1.35	0.0267	-0.0006	-0.27	ZZ
MQRY6D		0.0150	-0.0005	-0.34	0.0286	0.0014	0.65	ZZ
MT6MQY		0.0182	0.0027	2.06	0.0300	0.0028	1.33	ZZ
N3ETP7		0.0173	0.0018	1.39	0.0296	0.0024	1.15	ZZ
NXP3UV		0.0159	0.0004	0.31	0.0259	-0.0014	-0.66	ZZ
P32CJJ		0.0148	-0.0007	-0.49	0.0282	0.0010	0.46	ZZ
QABAF2		0.0168	0.0014	1.02	0.0288	0.0015	0.75	ZZ
QAVUDL		0.0136	-0.0019	-1.39	0.0252	-0.0020	-0.99	ZZ

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 146

Effective Case Depth - inches
SAE J423, SAE J78

WebCode	Data Flag	Sample C31			Sample C32			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QQJCZV		0.0156	0.0001	0.11	0.0258	-0.0014	-0.70	ZZ
QUJCD8		0.0144	-0.0011	-0.79	0.0232	-0.0040	-1.96	ZZ
QZAX8E		0.0158	0.0003	0.26	0.0258	-0.0014	-0.70	ZZ
R6E6Y3		0.0170	0.0015	1.16	0.0286	0.0014	0.65	ZZ
RP488P		0.0164	0.0009	0.71	0.0284	0.0012	0.56	ZZ
RWP8JV		0.0173	0.0019	1.42	0.0284	0.0011	0.55	ZZ
TM9XML		0.0169	0.0014	1.05	0.0302	0.0029	1.41	ZZ
U2BWXF		0.0169	0.0015	1.11	0.0303	0.0031	1.48	ZZ
U97YXF		0.0143	-0.0011	-0.84	0.0267	-0.0006	-0.27	ZZ
WPLW97		0.0146	-0.0009	-0.64	0.0262	-0.0010	-0.51	ZZ
X6FNT8		0.0157	0.0002	0.19	0.0313	0.0040	1.96	ZZ
XDQ2UB		0.0146	-0.0009	-0.64	0.0274	0.0002	0.07	ZZ
XUY2GK		0.0148	-0.0006	-0.49	0.0265	-0.0008	-0.38	ZZ

Summary Statistics

	Sample C31		Sample C32	
Grand Means	0.0155	inches	0.0272	inches
Std Dev Btwn Labs	0.0013	inches	0.0021	inches

Samples C31 , C32 : Steel

Statistics based on 60 of 62 reporting participants

Comments on assigned Data Flags for Analysis #146

WebCode Flag Analyst Comment

4YAZF8 X Data for sample C32 are low.

AQEZQG X Inconsistent in testing between samples.

Cycle 112
4th Q, 2015

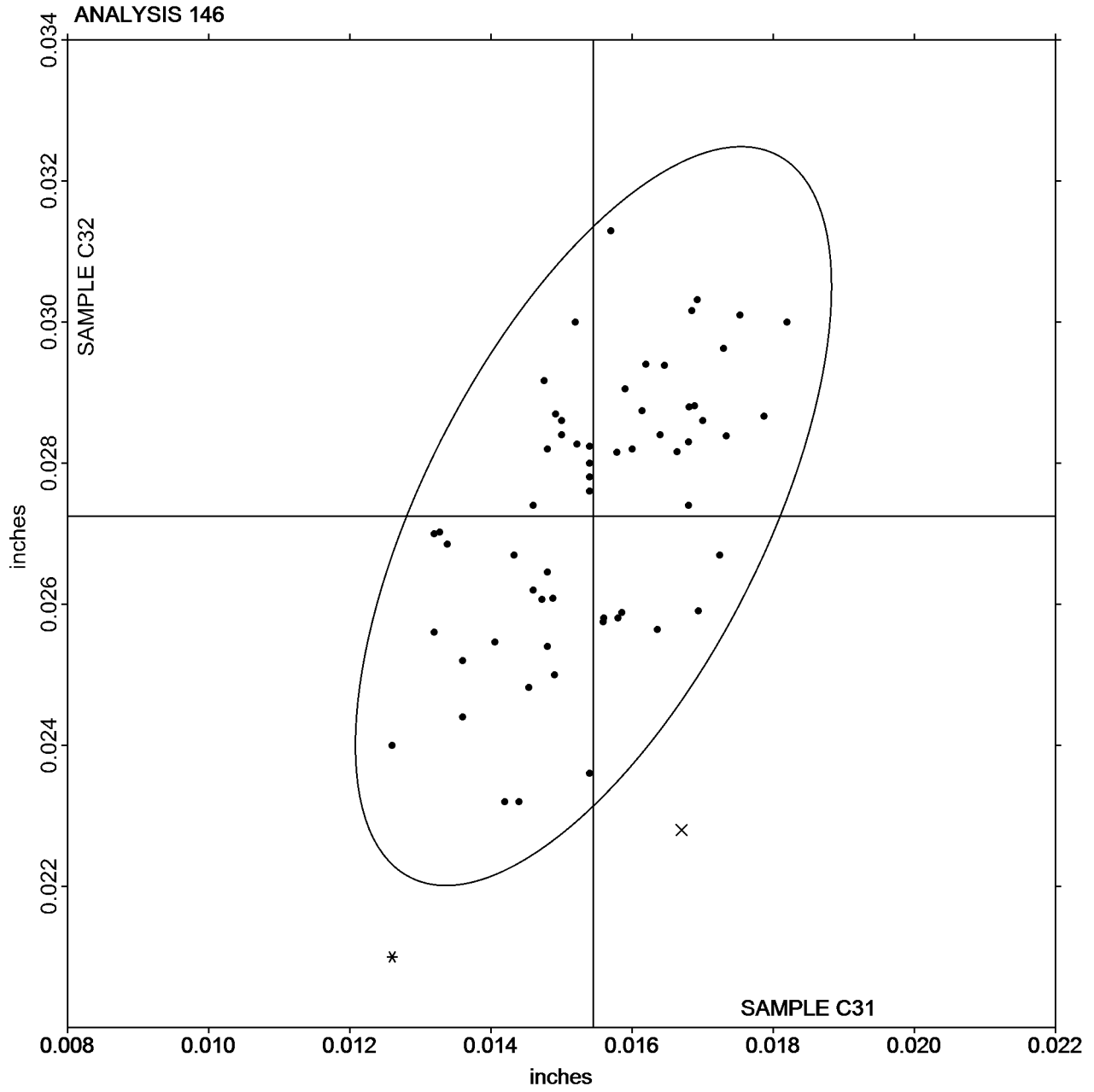
Interlaboratory Testing Program for Metals

Analysis 146

Effective Case Depth - inches
SAE J423, SAE J78

SAMPLE C31
0.0155 inches

SAMPLE C32
0.0272 inches



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 148

Grain Size (Inconel) - ASTM Grain Size Number (G)
ASTM E112, ASTM E1382

WebCode	Data Flag	Sample M1			Sample M2			Instr Code
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2X968E		9.60	0.79	1.17	7.50	-0.07	-0.11	ZZ
392YRL		8.50	-0.31	-0.46	7.20	-0.37	-0.61	ZZ
3U6VDN		8.60	-0.21	-0.31	7.50	-0.07	-0.11	ZZ
4B636U		9.20	0.39	0.58	7.60	0.03	0.06	ZZ
4RBLHC		8.70	-0.11	-0.16	7.40	-0.17	-0.28	ZZ
69X3L9		8.00	-0.81	-1.20	6.60	-0.97	-1.61	ZZ
6A34X7		9.80	0.99	1.46	8.60	1.03	1.72	ZZ
C4WUV6		8.30	-0.51	-0.75	7.80	0.23	0.39	ZZ
D3YPRW		8.10	-0.71	-1.05	7.00	-0.57	-0.94	ZZ
DGDXRZ		9.00	0.19	0.28	8.00	0.43	0.72	ZZ
DJQKCZ		9.50	0.69	1.02	8.10	0.53	0.89	ZZ
EFF482		8.62	-0.19	-0.28	7.82	0.25	0.42	ZZ
EUYU6H		9.40	0.59	0.87	7.37	-0.20	-0.33	ZZ
EZKMFH		8.60	-0.21	-0.31	7.00	-0.57	-0.94	ZZ
GJ9X7E		8.50	-0.31	-0.46	7.40	-0.17	-0.28	ZZ
HT9ZV4		8.71	-0.10	-0.15	7.35	-0.22	-0.36	ZZ
J96C7T		9.40	0.59	0.87	8.40	0.83	1.39	ZZ
JC4QUH		8.40	-0.41	-0.61	6.80	-0.77	-1.28	ZZ
LVP2TM	*	7.80	-1.01	-1.49	7.80	0.23	0.39	ZZ
LYA9TA	X	7.50	-1.31	-1.94	8.30	0.73	1.22	ZZ
MNMEM8		9.48	0.67	0.99	8.18	0.61	1.02	ZZ
MXWUA8		9.80	0.99	1.46	7.80	0.23	0.39	ZZ
P4V8XF		9.80	0.99	1.46	8.20	0.63	1.06	ZZ
QAVUDL		8.90	0.09	0.13	7.40	-0.17	-0.28	ZZ
QQJCZV		8.70	-0.11	-0.16	7.40	-0.17	-0.28	ZZ
UA3E9R		9.80	0.99	1.46	8.80	1.23	2.05	ZZ
UKZ8VW		7.40	-1.41	-2.08	6.60	-0.97	-1.61	ZZ
WWN7EY		8.00	-0.81	-1.20	6.40	-1.17	-1.94	ZZ
X9HM4Z		7.90	-0.91	-1.35	7.20	-0.37	-0.61	ZZ
ZYH4DF		9.00	0.19	0.28	8.20	0.63	1.06	ZZ

Summary Statistics

	Sample M1		Sample M2	
Grand Means	8.81	ASTM Grain Size	7.57	ASTM Grain Size
Std Dev Btwn Labs	0.68	ASTM Grain Size	0.60	ASTM Grain Size

Samples M1 , M2 : Inconel

Statistics based on 29 of 30 reporting participants

Comments on assigned Data Flags for Analysis #148

WebCode Flag Analyst Comment

LYA9TA X Inconsistent in testing between samples.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 148

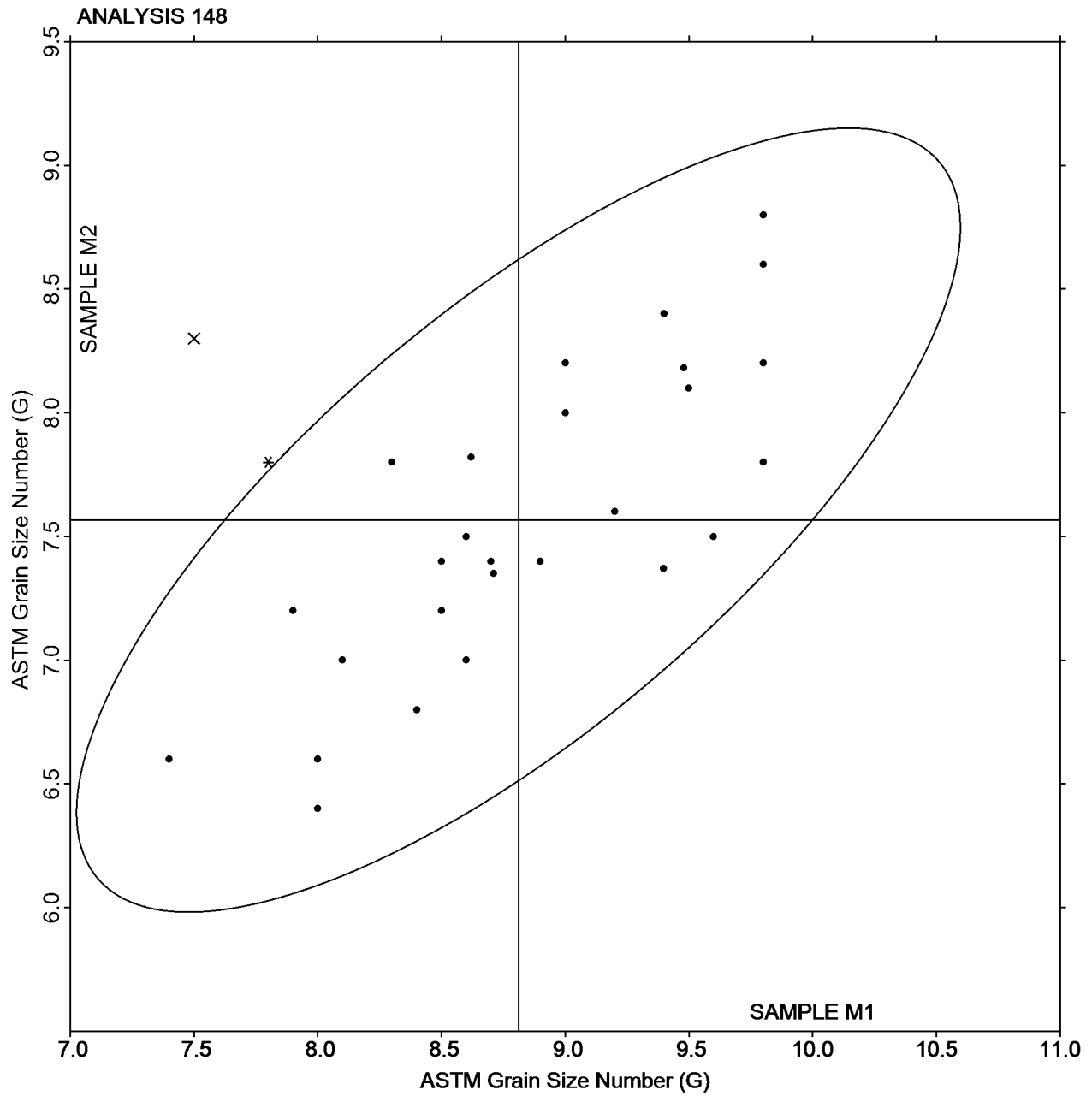
Grain Size (Inconel) - ASTM Grain Size Number (G)
ASTM E112, ASTM E1382

SAMPLE M1

8.81 ASTM Grain Size Number (G)

SAMPLE M2

7.57 ASTM Grain Size Number (G)



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 160

Chemical Analysis Element #1: Copper-based Alloy - Percent
COPPER (Cu)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		81.76	-0.21	-0.48	80.63	-0.32	-0.68	OE
3RBEQT		82.39	0.42	0.99	81.68	0.73	1.55	XX
4FH33L		81.90	-0.07	-0.16	80.87	-0.08	-0.17	OE
4RBLHC		82.70	0.73	1.71	81.68	0.73	1.56	OE
4YBZDL	*	83.26	1.29	3.03	82.52	1.58	3.36	ED
8BQC4D		81.93	-0.04	-0.10	80.66	-0.29	-0.61	OE
92HXX6		81.89	-0.08	-0.18	80.85	-0.10	-0.21	WD
9TRCR7		81.67	-0.30	-0.71	80.67	-0.28	-0.60	AA
AFJTVW		81.67	-0.30	-0.71	80.40	-0.55	-1.17	OE
F6XXWJ		81.51	-0.46	-1.08	80.82	-0.12	-0.26	GD
G9BXTA		82.01	0.04	0.10	80.66	-0.29	-0.62	OE
GFAA2Z		81.50	-0.47	-1.10	80.99	0.05	0.10	WD
LARLEK		82.03	0.06	0.14	80.80	-0.15	-0.32	ED
LXXFY8		81.88	-0.09	-0.22	80.87	-0.08	-0.17	EL
MXWUA8		81.80	-0.17	-0.40	80.86	-0.09	-0.18	IC
QQJC2G		82.49	0.52	1.22	81.42	0.48	1.02	EL
QZAX8E		81.74	-0.23	-0.54	80.56	-0.39	-0.83	OE
TFU3UY		82.54	0.57	1.35	81.33	0.38	0.81	OE
U97YXF		81.63	-0.34	-0.79	80.60	-0.35	-0.75	OE
VDGAQA		81.97	0.00	0.00	80.90	-0.05	-0.10	OE
VDY9Z2		81.72	-0.25	-0.59	80.72	-0.22	-0.47	GR
VGGKLA		82.10	0.13	0.32	80.92	-0.03	-0.06	BD
WZBJLG		81.50	-0.47	-1.11	80.39	-0.56	-1.19	OE
ZTFWXD		82.10	0.13	0.30	80.99	0.04	0.09	IC
ZUPX3K		81.55	-0.42	-0.99	80.90	-0.05	-0.10	BD

Summary Statistics

	Sample K31		Sample K32	
Grand Means	81.97	Percent	80.95	Percent
Std Dev Btwn Labs	0.43	Percent	0.47	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 25 of 25 reporting participants

Cycle 112
4th Q, 2015

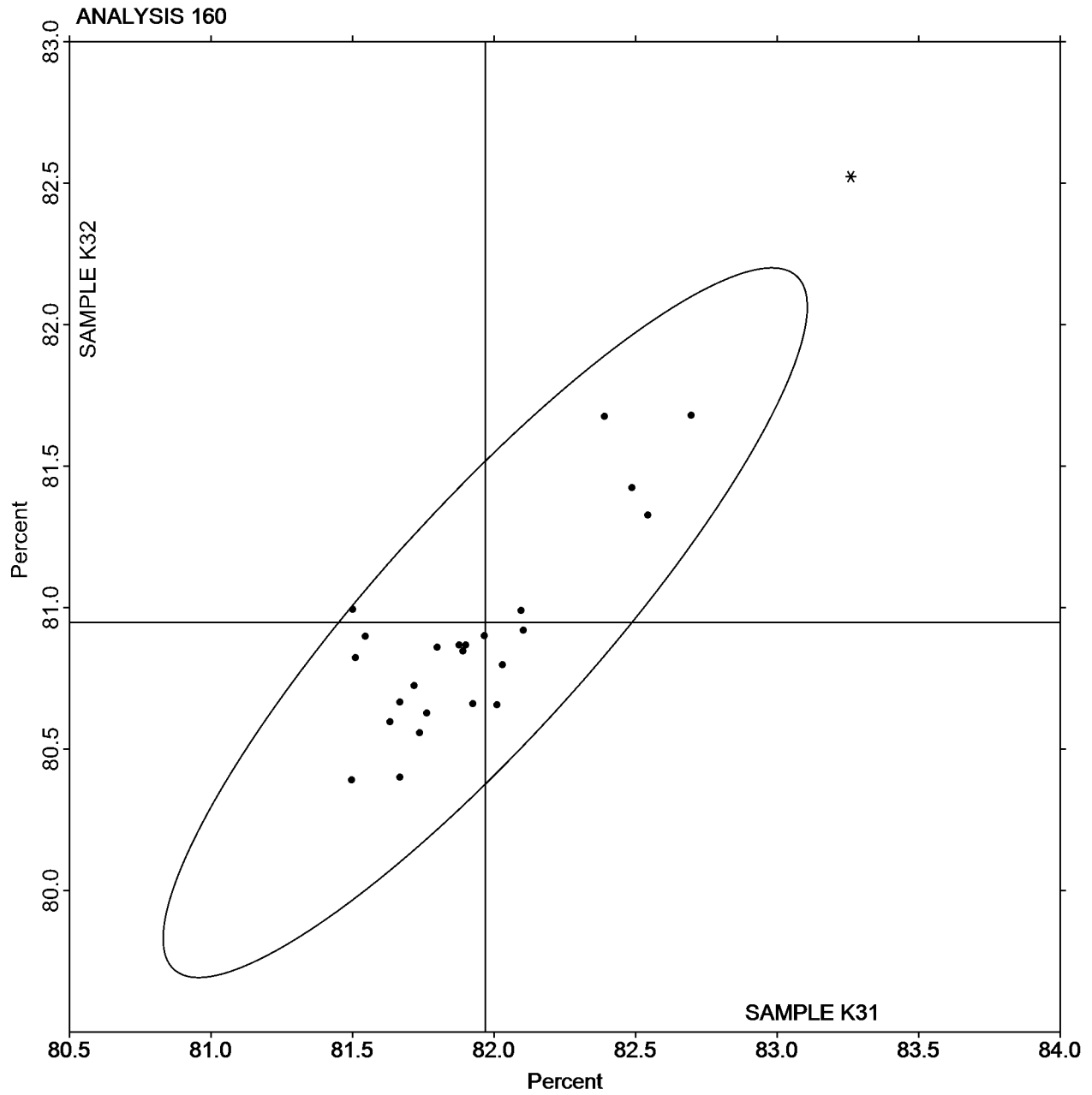
Interlaboratory Testing Program for Metals

Analysis 160

Chemical Analysis Element #1: Copper-based Alloy - Percent
COPPER (Cu)

SAMPLE K31
81.97 Percent

SAMPLE K32
80.95 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 161

Chemical Analysis Element #2: Copper-based Alloy - Percent
ALUMINUM (Al)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		9.876	0.257	1.10	9.854	0.123	0.52	OE
3RBEQT		9.261	-0.358	-1.53	9.209	-0.522	-2.21	XX
4FH33L		9.597	-0.022	-0.10	9.727	-0.004	-0.02	OE
4RBLHC		9.283	-0.336	-1.44	9.414	-0.317	-1.34	OE
4YBZDL	X	8.147	-1.472	-6.30	8.119	-1.612	-6.84	ED
8BQC4D		9.603	-0.016	-0.07	9.793	0.063	0.27	OE
92HXX6		9.707	0.088	0.38	9.820	0.089	0.38	WD
9FHNV3		9.733	0.114	0.49	9.848	0.118	0.50	IC
AFJTVW		9.730	0.111	0.47	9.927	0.196	0.83	OE
DNEANX		9.713	0.094	0.40	9.780	0.049	0.21	OE
F6XXWJ	*	10.10	0.481	2.06	9.727	-0.004	-0.02	GD
G9BXTA		9.523	-0.096	-0.41	9.817	0.086	0.36	OE
GFAA2Z		9.743	0.124	0.53	9.861	0.130	0.55	WD
LARLEK		9.895	0.276	1.18	9.985	0.255	1.08	ED
MXWUA8		9.606	-0.013	-0.05	9.719	-0.011	-0.05	IC
QQJC2G		9.593	-0.026	-0.11	9.963	0.233	0.99	IC
QZAX8E		9.586	-0.033	-0.14	9.755	0.025	0.10	OE
TFU3UY		9.393	-0.226	-0.97	9.773	0.043	0.18	OE
U97YXF		9.883	0.264	1.13	10.10	0.366	1.55	OE
UD46V7		9.500	-0.119	-0.51	9.662	-0.069	-0.29	IC
VDGAQA		9.693	0.074	0.32	9.697	-0.034	-0.14	OE
VDY9Z2		9.547	-0.072	-0.31	9.443	-0.287	-1.22	IC
VGGKLA		9.447	-0.172	-0.74	9.650	-0.081	-0.34	OE
WZBJLG		9.960	0.341	1.46	10.04	0.306	1.30	XX
ZTFWXD		9.429	-0.190	-0.81	9.610	-0.121	-0.51	IC
ZUPX3K	*	9.073	-0.546	-2.34	9.100	-0.631	-2.67	IC

Summary Statistics

	Sample K31		Sample K32	
Grand Means	9.619	Percent	9.731	Percent
Std Dev Btwn Labs	0.234	Percent	0.236	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 25 of 26 reporting participants

Comments on assigned Data Flags for Analysis #161

WebCode Flag Analyst Comment

4YBZDL X Data for both samples are low. Possible Systematic error.

Cycle 112
4th Q, 2015

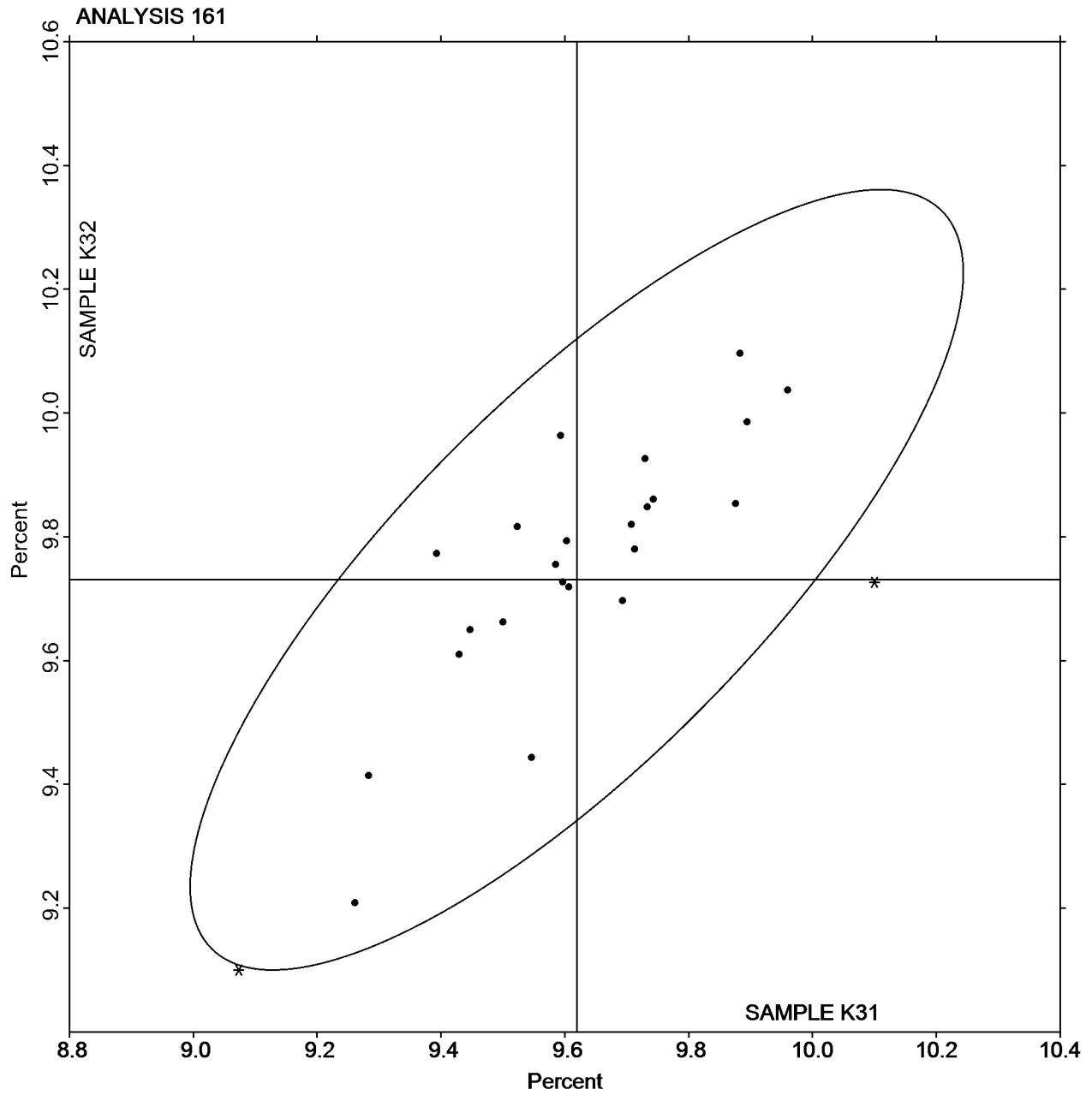
Interlaboratory Testing Program for Metals

Analysis 161

Chemical Analysis Element #2: Copper-based Alloy - Percent
ALUMINUM (Al)

SAMPLE K31
9.619 Percent

SAMPLE K32
9.731 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 162

Chemical Analysis Element #3: Copper-based Alloy - Percent
IRON (Fe)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		2.852	-0.093	-1.08	3.555	-0.204	-1.81	OE
3RBEQT		2.972	0.027	0.31	3.621	-0.137	-1.22	XX
4FH33L		3.117	0.172	2.00	3.867	0.108	0.96	OE
4RBLHC	*	2.682	-0.263	-3.06	3.451	-0.307	-2.73	OE
4YBZDL		3.007	0.062	0.72	3.814	0.055	0.49	ED
8BQC4D		2.923	-0.022	-0.25	3.837	0.078	0.70	OE
92HXX6		2.916	-0.029	-0.34	3.712	-0.046	-0.41	WD
9FHNV3		3.020	0.075	0.87	3.831	0.072	0.64	IC
9TRCR7		2.900	-0.045	-0.52	3.640	-0.118	-1.05	AA
AFJTVW		2.959	0.014	0.16	3.833	0.075	0.67	OE
DNEANX		2.987	0.042	0.48	3.844	0.086	0.76	OE
F6XXWJ		2.913	-0.032	-0.37	3.670	-0.088	-0.79	GD
G9BXTA		2.953	0.008	0.10	3.813	0.055	0.49	OE
GFAA2Z		3.087	0.142	1.65	3.733	-0.026	-0.23	WD
LARLEK		2.906	-0.039	-0.46	3.842	0.083	0.74	ED
MXWUA8		2.985	0.040	0.46	3.720	-0.038	-0.34	IC
QQJC2G		2.893	-0.052	-0.60	3.820	0.062	0.55	IC
QZAX8E		2.988	0.043	0.50	3.888	0.130	1.16	OE
TFU3UY		2.870	-0.075	-0.87	3.787	0.028	0.25	OE
U97YXF		3.017	0.072	0.83	3.861	0.103	0.92	OE
VDGAQA		2.870	-0.075	-0.87	3.660	-0.098	-0.87	OE
VDY9Z2		2.930	-0.015	-0.18	3.753	-0.005	-0.05	IC
VGGKLA		2.933	-0.012	-0.14	3.749	-0.009	-0.08	OE
WZBJLG		3.035	0.090	1.05	3.933	0.175	1.56	XX
ZTFWXD		2.914	-0.031	-0.37	3.723	-0.035	-0.31	IC
ZUPX3K	X	3.453	0.508	5.91	3.957	0.198	1.76	IC

Summary Statistics				
	Sample K31		Sample K32	
Grand Means	2.945	Percent	3.758	Percent
Std Dev Btwn Labs	0.086	Percent	0.112	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 25 of 26 reporting participants

Comments on assigned Data Flags for Analysis #162

WebCode Flag Analyst Comment

ZUPX3K X Data for sample K31 are high.

Cycle 112
4th Q, 2015

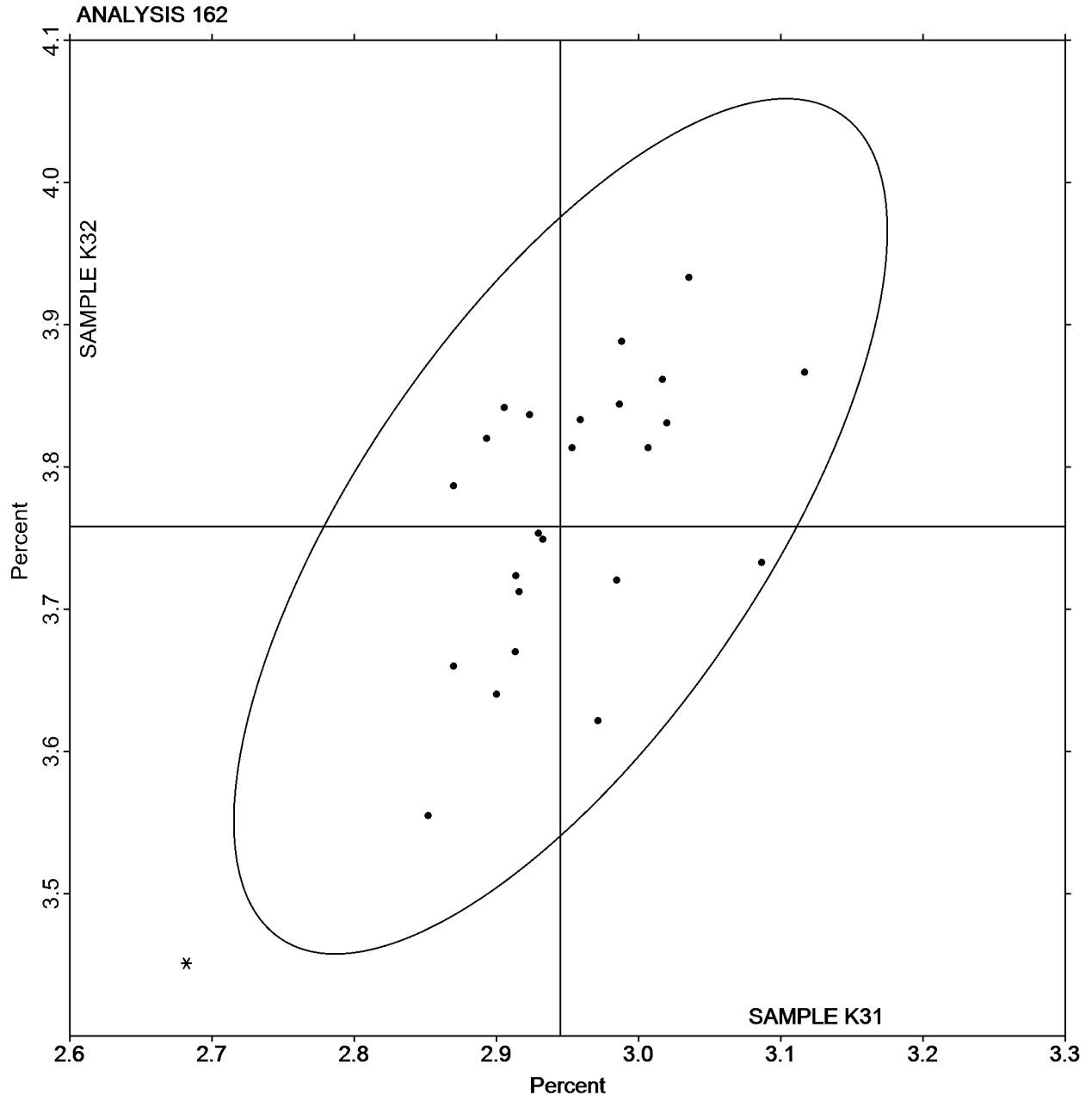
Interlaboratory Testing Program for Metals

Analysis 162

Chemical Analysis Element #3: Copper-based Alloy - Percent
IRON (Fe)

SAMPLE K31
2.945 Percent

SAMPLE K32
3.758 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 163

Chemical Analysis Element #4: Copper-based Alloy - Percent
MANGANESE (Mn)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV	X	0.4173	0.0854	4.94	1.012	0.3091	8.45	OE
3RBEQT		0.3397	0.0077	0.45	0.7257	0.0224	0.61	XX
4FH33L		0.2940	-0.0380	-2.20	0.6267	-0.0766	-2.10	OE
4RBLHC		0.3330	0.0010	0.06	0.7187	0.0154	0.42	OE
4YBZDL		0.2933	-0.0386	-2.24	0.6629	-0.0404	-1.10	ED
8BQC4D		0.3490	0.0170	0.99	0.7467	0.0434	1.19	OE
92HXX6		0.3430	0.0110	0.64	0.7103	0.0071	0.19	OE
9FHNV3		0.3257	-0.0063	-0.36	0.7150	0.0117	0.32	IC
AFJTVW	X	0.3703	0.0384	2.22	0.9777	0.2744	7.51	OE
DNEANX		0.3360	0.0040	0.23	0.7033	0.0001	0.00	OE
F6XXWJ		0.3263	-0.0056	-0.33	0.7277	0.0244	0.67	GD
G9BXTA		0.3250	-0.0070	-0.40	0.6933	-0.0099	-0.27	IC
GFAA2Z		0.3287	-0.0033	-0.19	0.7077	0.0044	0.12	WD
LARLEK		0.3433	0.0114	0.66	0.7450	0.0417	1.14	ED
MXWUA8		0.3300	-0.0020	-0.11	0.7040	0.0007	0.02	IC
QQJC2G		0.3390	0.0070	0.41	0.7070	0.0037	0.10	IC
QZAX8E		0.3740	0.0420	2.43	0.7520	0.0487	1.33	OE
TFU3UY		0.3303	-0.0016	-0.09	0.6530	-0.0503	-1.38	OE
U97YXF	*	0.3037	-0.0283	-1.64	0.6067	-0.0966	-2.64	OE
UD46V7		0.3252	-0.0067	-0.39	0.6804	-0.0228	-0.62	IC
VDGAQA		0.3433	0.0114	0.66	0.7200	0.0167	0.46	OE
VDY9Z2		0.3314	-0.0006	-0.03	0.6998	-0.0034	-0.09	IC
VGGKLA		0.3333	0.0014	0.08	0.7223	0.0191	0.52	OE
WZBJLG		0.3430	0.0110	0.64	0.6997	-0.0036	-0.10	XX
ZTFWXD		0.3290	-0.0030	-0.17	0.6973	-0.0059	-0.16	IC
ZUPX3K		0.3480	0.0160	0.93	0.7533	0.0501	1.37	IC

Summary Statistics				
	Sample K31		Sample K32	
Grand Means	0.3320	Percent	0.7033	Percent
Std Dev Btwn Labs	0.0173	Percent	0.0366	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 24 of 26 reporting participants

Comments on assigned Data Flags for Analysis #163

WebCode	Flag	Analyst Comment
3H7CLV	X	Data for both samples are high.
AFJTVW	X	Data for sample K32 are high.

Cycle 112
4th Q, 2015

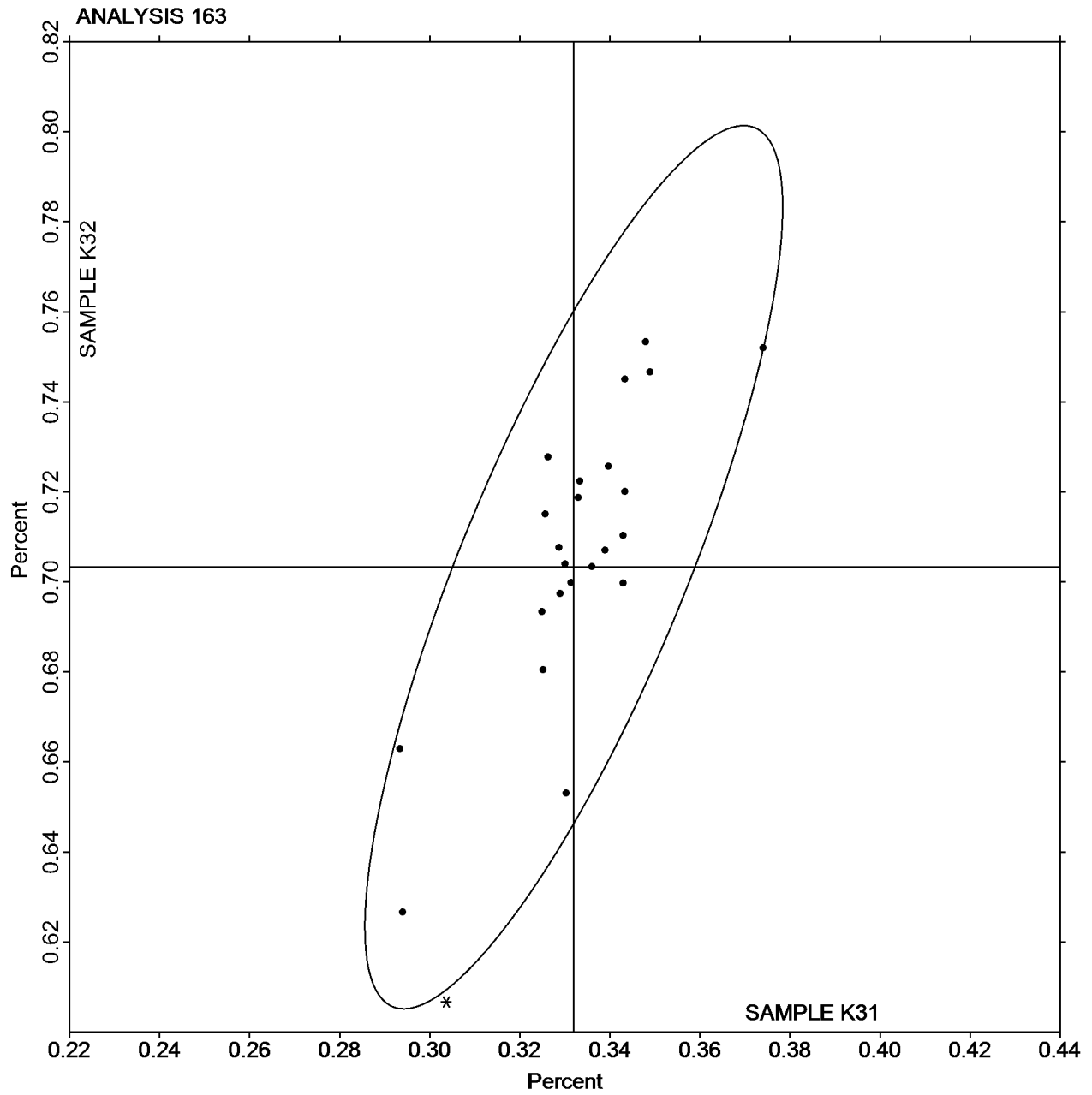
Interlaboratory Testing Program for Metals

Analysis 163

Chemical Analysis Element #4: Copper-based Alloy - Percent
MANGANESE (Mn)

SAMPLE K31
0.3320 Percent

SAMPLE K32
0.7033 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 164

Chemical Analysis Element #5: Copper-based Alloy - Percent
NICKEL (Ni)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		4.905	-0.119	-1.35	4.837	-0.004	-0.04	OE
3RBEQT		4.924	-0.099	-1.13	4.737	-0.104	-0.97	XX
4FH33L		5.027	0.003	0.03	4.827	-0.014	-0.13	OE
4RBLHC		4.811	-0.213	-2.43	4.624	-0.217	-2.03	OE
4YBZDL		5.127	0.103	1.17	4.836	-0.005	-0.05	ED
8BQC4D		5.087	0.063	0.72	4.877	0.036	0.33	OE
92HXX6		4.990	-0.034	-0.39	4.844	0.003	0.02	WD
9FHNV3		5.085	0.061	0.69	4.909	0.068	0.63	IC
9TRCR7		5.003	-0.020	-0.23	4.797	-0.044	-0.41	AA
AFJTVW		5.127	0.103	1.17	4.774	-0.067	-0.63	OE
DNEANX		5.125	0.101	1.15	4.867	0.026	0.24	OE
F6XXWJ		4.930	-0.094	-1.07	4.700	-0.141	-1.31	GD
G9BXTA		5.053	0.030	0.34	4.923	0.082	0.77	OE
GFAA2Z		4.988	-0.035	-0.40	4.801	-0.040	-0.37	WD
LARLEK		4.861	-0.163	-1.86	4.579	-0.262	-2.44	ED
MXWUA8		5.045	0.022	0.25	4.872	0.031	0.29	IC
QQJC2G		5.200	0.176	2.01	5.067	0.226	2.10	IC
QZAX8E		5.125	0.102	1.16	4.959	0.118	1.10	OE
TFU3UY		5.060	0.036	0.41	5.003	0.162	1.51	OE
U97YXF		5.007	-0.017	-0.20	4.766	-0.075	-0.70	OE
UD46V7		5.029	0.005	0.06	4.910	0.069	0.64	IC
VDGAQA		5.003	-0.020	-0.23	4.940	0.099	0.92	OE
VDY9Z2		5.030	0.006	0.07	4.793	-0.048	-0.45	IC
VGGKLA		5.033	0.009	0.10	4.879	0.038	0.35	OE
WZBJLG		5.001	-0.022	-0.26	4.846	0.005	0.05	XX
ZTFWXD		5.043	0.019	0.21	4.902	0.061	0.57	IC
ZUPX3K	X	5.457	0.433	4.94	5.250	0.409	3.81	IC

Summary Statistics				
	<u>Sample K31</u>		<u>Sample K32</u>	
Grand Means	5.024	Percent	4.841	Percent
Std Dev Btwn Labs	0.088	Percent	0.107	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 26 of 27 reporting participants

Comments on assigned Data Flags for Analysis #164

WebCode Flag Analyst Comment

ZUPX3K X Data for both samples are high. Inconsistent within the determinations of sample K32.

Cycle 112
4th Q, 2015

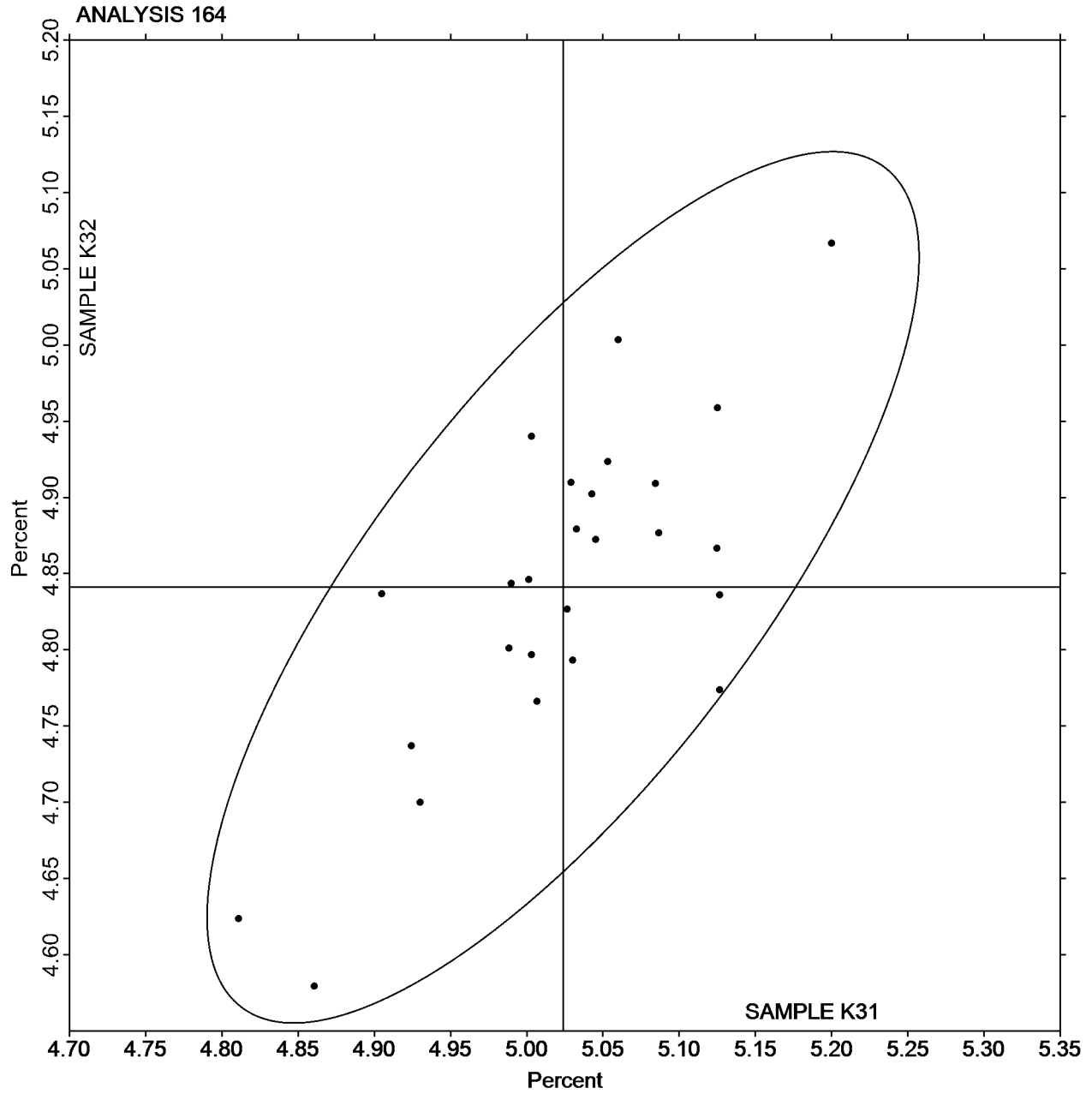
Interlaboratory Testing Program for Metals

Analysis 164

Chemical Analysis Element #5: Copper-based Alloy - Percent
NICKEL (Ni)

SAMPLE K31
5.024 Percent

SAMPLE K32
4.841 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 165

Chemical Analysis Element #6: Copper-based Alloy - Percent
TIN (Sn)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		0.0797	-0.0048	-0.25	0.00130	-0.00466	-0.78	OE
3RBEQT	M	0.0701	-0.0143	-0.76	No Data Reported			XX
4FH33L	*	0.0267	-0.0578	-3.05	0.00273	-0.00323	-0.54	OE
4RBLHC		0.1080	0.0236	1.25	0.0207	0.01474	2.45	OE
4YBZDL	M	0.1100	0.0256	1.35	No Data Reported			ED
8BQC4D		0.0617	-0.0228	-1.20	0.00800	0.00204	0.34	OE
92HXX6		0.0683	-0.0161	-0.85	0.00700	0.00104	0.17	OE
9FHNV3		0.1080	0.0236	1.25	0.00260	-0.00336	-0.56	IC
AFJTVW	M	0.0813	-0.0031	-0.16	No Data Reported			OE
DNEANX		0.1050	0.0206	1.09	0.00247	-0.00350	-0.58	OE
F6XXWJ		0.0890	0.0046	0.24	0.00300	-0.00296	-0.49	GD
G9BXTA		0.0825	-0.0019	-0.10	0.00090	-0.00506	-0.84	IC
GFAA2Z		0.0920	0.0076	0.40	0.00957	0.00360	0.60	OE
MXWUA8		0.0870	0.0026	0.14	0.00210	-0.00386	-0.64	IC
QQJC2G		0.0900	0.0056	0.29	0.00377	-0.00220	-0.37	IC
QZAX8E	M	0.0990	0.0146	0.77	No Data Reported			OE
TFU3UY		0.0950	0.0106	0.56	0.0210	0.01504	2.50	OE
U97YXF		0.0837	-0.0008	-0.04	0.00517	-0.00080	-0.13	OE
UD46V7		0.0820	-0.0024	-0.13	0.00163	-0.00433	-0.72	IC
VGGKLA		0.0870	0.0026	0.14	0.00587	-0.00010	-0.02	OE
WZBJLG		0.0960	0.0116	0.61	0.00800	0.00204	0.34	XX
ZTFWXD		0.0783	-0.0061	-0.32	0.00157	-0.00440	-0.73	IC
ZUPX3K	M	0.0880	0.0036	0.19	No Data Reported			IC

Summary Statistics

	Sample K31		Sample K32	
Grand Means	0.0844	Percent	0.00596	Percent
Std Dev Btwn Labs	0.0189	Percent	0.00601	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 18 of 23 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 165
Chemical Analysis Element #6: Copper-based Alloy - Percent
TIN (Sn)

Comments on assigned Data Flags for Analysis #165

WebCode Flag Analyst Comment

3RBEQT M Laboratory did not submit data for sample K32.

4YBZDL M Laboratory did not submit data for sample K32. Inconsistent within the determinations of sample K31.

AFJTVW M Laboratory did not submit data for sample K32.

QZAX8E M Laboratory did not submit data for sample K32.

ZUPX3K M Laboratory did not submit data for sample K32.

Cycle 112
4th Q, 2015

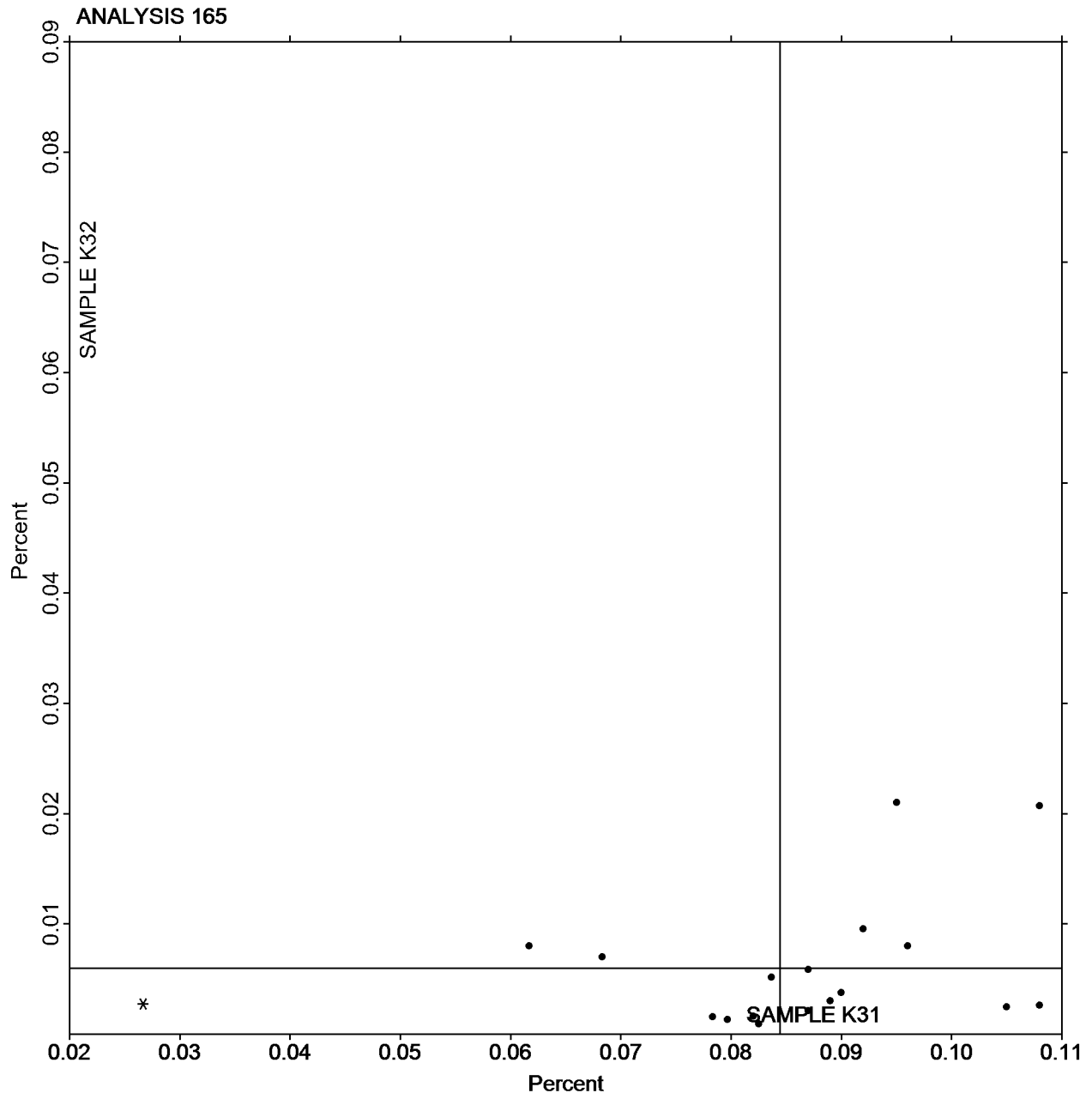
Interlaboratory Testing Program for Metals

Analysis 165

Chemical Analysis Element #6: Copper-based Alloy - Percent
TIN (Sn)

SAMPLE K31
0.0844 Percent

SAMPLE K32
0.00596 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 166

Chemical Analysis Element #7: Copper-based Alloy - Percent SILICON (Si)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		0.0277	0.0023	0.55	0.0187	0.0020	0.45	OE
3RBEQT		0.0222	-0.0031	-0.72	0.0131	-0.0036	-0.82	XX
4RBLHC		0.0319	0.0065	1.53	0.0202	0.0036	0.81	OE
8BQC4D		0.0237	-0.0017	-0.39	0.0167	0.0000	0.00	OE
92HXX6		0.0260	0.0007	0.16	0.0190	0.0023	0.53	OE
9FHNV3		0.0225	-0.0028	-0.66	0.0136	-0.0031	-0.71	IC
AFJTVW		0.0278	0.0025	0.59	0.0214	0.0047	1.07	OE
DNEANX		0.0225	-0.0028	-0.66	0.0139	-0.0028	-0.64	OE
F6XXWJ		0.0173	-0.0080	-1.87	0.00667	-0.0100	-2.27	GD
G9BXTA		0.0259	0.0006	0.14	0.0176	0.0009	0.20	OE
GFAA2Z		0.0280	0.0026	0.62	0.0222	0.0056	1.26	OE
MXWUA8		0.0231	-0.0023	-0.53	0.0140	-0.0026	-0.60	IC
QQJC2G		0.0218	-0.0035	-0.82	0.0133	-0.0034	-0.77	IC
QZAX8E		0.0264	0.0011	0.25	0.0179	0.0012	0.27	OE
TFU3UY		0.0290	0.0037	0.86	0.0213	0.0047	1.06	OE
U97YXF		0.0228	-0.0025	-0.59	0.0135	-0.0032	-0.73	OE
VDGAQA		0.0300	0.0047	1.09	0.0200	0.0033	0.75	OE
VGGKLA		0.0184	-0.0070	-1.63	0.00947	-0.0072	-1.64	OE
WZBJLG		0.0260	0.0007	0.16	0.0200	0.0033	0.75	XX
ZTFWXD		0.0236	-0.0018	-0.41	0.0142	-0.0024	-0.56	IC
ZUPX3K	*	0.0353	0.0100	2.34	0.0237	0.0070	1.59	IC

Summary Statistics

	<u>Sample K31</u>		<u>Sample K32</u>	
Grand Means	0.0253	Percent	0.0167	Percent
Std Dev Btwn Labs	0.0043	Percent	0.0044	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 21 of 21 reporting participants

Cycle 112
4th Q, 2015

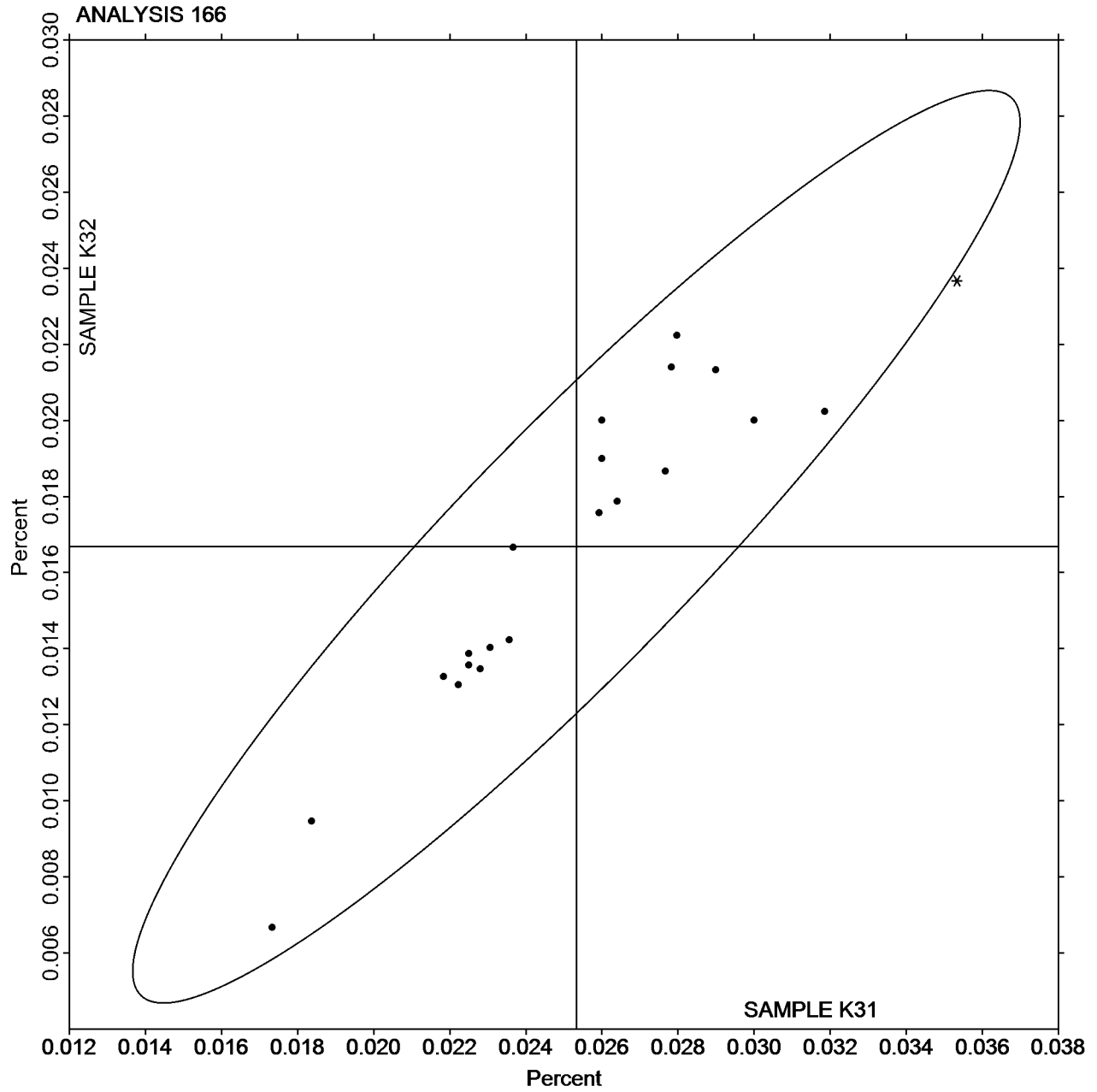
Interlaboratory Testing Program for Metals

Analysis 166

Chemical Analysis Element #7: Copper-based Alloy - Percent
SILICON (Si)

SAMPLE K31
0.0253 Percent

SAMPLE K32
0.0167 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 167

Chemical Analysis Element #8: Copper-based Alloy - Percent
ZINC (Zn)

WebCode	Data Flag	Sample K31			Sample K32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
3H7CLV		0.00810	0.00132	0.39	0.0203	-0.0011	-0.27	OE
3RBEQT	M	No Data Reported			0.00315	-0.0183	-4.57	XX
4FH33L		0.00647	-0.00031	-0.09	0.0220	0.0006	0.14	OE
4RBLHC		0.00580	-0.00098	-0.29	0.0160	-0.0054	-1.35	OE
8BQC4D		0.00700	0.00022	0.06	0.0273	0.0059	1.48	OE
9FHNV3		0.00573	-0.00105	-0.31	0.0204	-0.0010	-0.26	IC
AFJTVW	M	No Data Reported			0.0132	-0.0082	-2.06	OE
DNEANX		0.00577	-0.00101	-0.30	0.0199	-0.0016	-0.39	OE
F6XXWJ		0.00733	0.00055	0.16	0.0257	0.0042	1.06	GD
G9BXTA		0.00400	-0.00278	-0.82	0.0193	-0.0021	-0.52	IC
GFAA2Z	*	0.0176	0.01085	3.19	0.0312	0.0097	2.44	OE
MXWUA8		0.00443	-0.00235	-0.69	0.0199	-0.0016	-0.39	IC
QQJC2G		0.00217	-0.00461	-1.36	0.0151	-0.0063	-1.57	IC
QZAX8E		0.00740	0.00062	0.18	0.0231	0.0017	0.43	OE
TFU3UY		0.0110	0.00419	1.23	0.0246	0.0032	0.80	OE
UD46V7		0.00480	-0.00198	-0.58	0.0183	-0.0032	-0.79	IC
VGGKLA		0.00687	0.00009	0.03	0.0209	-0.0005	-0.12	OE
WZBJLG		0.00633	-0.00045	-0.13	0.0200	-0.0014	-0.36	XX
ZTFWXD		0.00447	-0.00231	-0.68	0.0201	-0.0013	-0.33	IC
ZUPX3K	M	No Data Reported			0.0180	-0.0034	-0.86	IC

Summary Statistics

	Sample K31		Sample K32	
Grand Means	0.00678	Percent	0.0214	Percent
Std Dev Btwn Labs	0.00340	Percent	0.0040	Percent

Samples K31 , K32 : CDA 630, two different heats

Statistics based on 17 of 20 reporting participants

Comments on assigned Data Flags for Analysis #167

WebCode	Flag	Analyst Comment
3RBEQT	M	Laboratory did not submit data for sample K31.
AFJTVW	M	Laboratory did not submit data for sample K31.
ZUPX3K	M	Laboratory did not submit data for sample K31.

Cycle 112
4th Q, 2015

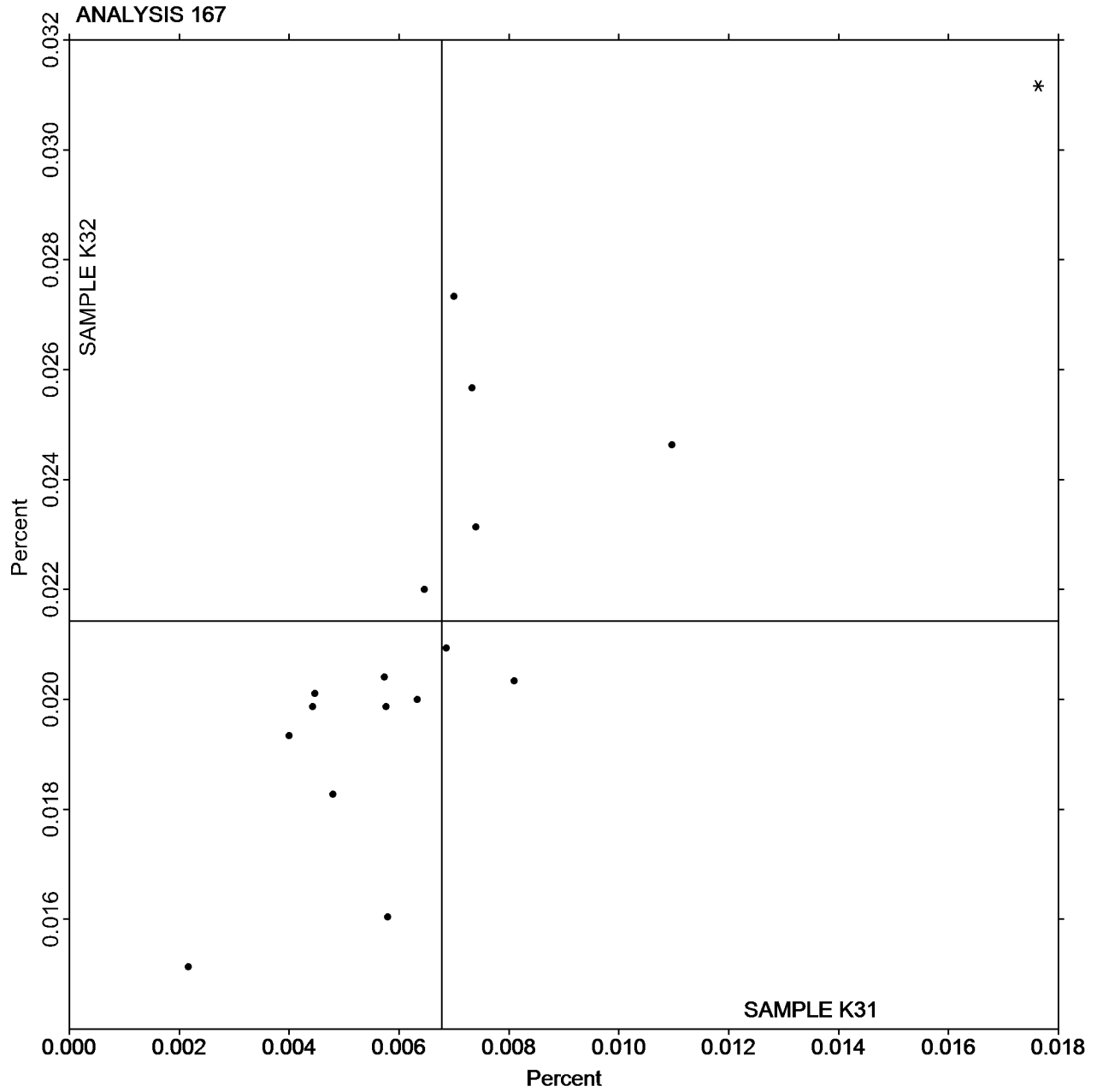
Interlaboratory Testing Program for Metals

Analysis 167

Chemical Analysis Element #8: Copper-based Alloy - Percent
ZINC (Zn)

SAMPLE K31
0.00678 Percent

SAMPLE K32
0.0214 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 180

Chemical Analysis Element #1 - Corrosion Resistant Steel - Percent
CARBON (C)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.0513	0.0026	0.79	0.0443	-0.0014	-0.45	CI
33UTRA		0.0473	-0.0015	-0.45	0.0438	-0.0020	-0.63	CI
3H4G3P		0.0520	0.0032	0.99	0.0496	0.0038	1.19	OE
4B636U		0.0543	0.0056	1.71	0.0483	0.0026	0.80	CI
4ENAGB		0.0477	-0.0011	-0.33	0.0456	-0.0002	-0.07	CI
4FH33L		0.0510	0.0022	0.68	0.0487	0.0029	0.90	OE
4FXEUY		0.0433	-0.0055	-1.69	0.0403	-0.0055	-1.71	CI
4RBLHC		0.0447	-0.0041	-1.27	0.0428	-0.0030	-0.94	CO
7QM6C9		0.0490	0.0002	0.07	0.0450	-0.0008	-0.24	GD
7U8WPW	X	0.0580	0.0092	2.84	0.0490	0.0032	1.01	OE
8BQC4D		0.0507	0.0019	0.58	0.0450	-0.0008	-0.24	OE
92HXX6		0.0473	-0.0014	-0.45	0.0437	-0.0021	-0.66	CO
9FHNTG		0.0517	0.0029	0.89	0.0493	0.0036	1.11	OE
9FHNV3		0.0503	0.0016	0.48	0.0494	0.0036	1.13	CO
A3UWRD	X	0.0343	-0.0144	-4.45	0.0323	-0.0134	-4.20	CI
AFJTVW		0.0463	-0.0025	-0.76	0.0447	-0.0011	-0.35	CO
AQEZQG		0.0480	-0.0008	-0.24	0.0453	-0.0004	-0.14	OE
BEHMLG		0.0480	-0.0008	-0.25	0.0446	-0.0011	-0.36	CI
CBV64V		0.0462	-0.0026	-0.79	0.0442	-0.0016	-0.49	IR
CVN2NW	X	0.0380	-0.0108	-3.32	0.0299	-0.0159	-4.98	OE
DAVP2H		0.0460	-0.0028	-0.86	0.0420	-0.0038	-1.18	GD
DNEANX		0.0511	0.0023	0.71	0.0494	0.0037	1.14	OE
DQ694G		0.0510	0.0022	0.68	0.0483	0.0026	0.80	XX
DVH8HV		0.0505	0.0017	0.53	0.0462	0.0005	0.14	OE
EUYU6H		0.0537	0.0050	1.52	0.0524	0.0067	2.08	OE
EYCN8U		0.0527	0.0039	1.20	0.0487	0.0029	0.90	OE
F2Z9PJ	X	0.0650	0.0162	4.99	0.0637	0.0179	5.60	OE
FMFW42		0.0492	0.0004	0.12	0.0444	-0.0013	-0.42	CI
FPKEEQ		0.0503	0.0016	0.48	0.0443	-0.0014	-0.45	OE
GA4QPT		0.0473	-0.0015	-0.47	0.0455	-0.0002	-0.08	CI
GEYKMU	*	0.0490	0.0002	0.07	0.0507	0.0049	1.53	CI
GFAA2Z		0.0467	-0.0020	-0.63	0.0450	-0.0008	-0.24	CI
GTLQXX		0.0427	-0.0061	-1.88	0.0407	-0.0051	-1.60	IR
H6PHTG		0.0517	0.0029	0.89	0.0473	0.0016	0.49	OE
J8TMT9	*	0.0553	0.0066	2.02	0.0540	0.0082	2.57	OE
JCNGPN		0.0486	-0.0002	-0.07	0.0455	-0.0003	-0.09	OE
JE8NZ6	X	5.167	5.1179	1,575.6	4.810	4.7642	1,490.2	ED
JK34ZD		0.0493	0.0006	0.17	0.0440	-0.0018	-0.56	OE
LTN7XQ		0.0480	-0.0008	-0.24	0.0473	0.0016	0.49	OE
LXDNAG	X	0.0600	0.0112	3.45	0.0500	0.0042	1.32	OE
MFGK97		0.0477	-0.0011	-0.34	0.0453	-0.0004	-0.14	CI
MK8UH6	X	0.0547	0.0059	1.81	0.0560	0.0102	3.20	OE
NN2B94		0.0470	-0.0018	-0.55	0.0440	-0.0018	-0.56	CI
PNZME7		0.0507	0.0019	0.59	0.0483	0.0026	0.80	OE
QE64D4		0.0477	-0.0011	-0.34	0.0437	-0.0021	-0.66	OE
QQJC2G		0.0468	-0.0019	-0.60	0.0427	-0.0031	-0.96	GD
QQJCZV		0.0550	0.0062	1.91	0.0453	-0.0004	-0.14	CO
QUJCD8		0.0513	0.0026	0.79	0.0473	0.0016	0.49	OE
QZAX8E		0.0494	0.0006	0.19	0.0468	0.0010	0.32	OE

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 180

Chemical Analysis Element #1 - Corrosion Resistant Steel - Percent
CARBON (C)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
RWP8JV		0.0493	0.0006	0.17	0.0457	-0.0001	-0.03	OE
TFU3UY		0.0413	-0.0074	-2.29	0.0393	-0.0064	-2.02	OE
TK4FCX		0.0468	-0.0020	-0.62	0.0435	-0.0022	-0.70	CI
TV9F2X		0.0443	-0.0044	-1.37	0.0417	-0.0041	-1.29	CI
U97YXF		0.0431	-0.0057	-1.76	0.0405	-0.0053	-1.65	OE
VDGAQA	*	0.0573	0.0086	2.63	0.0527	0.0069	2.16	OE
VGGKLA		0.0513	0.0026	0.79	0.0475	0.0017	0.53	OE
WDWVXQ	X	0.0343	-0.0144	-4.45	0.0323	-0.0134	-4.20	CI
WZBJLG		0.0470	-0.0018	-0.55	0.0440	-0.0018	-0.56	OE
X9HM4Z		0.0458	-0.0030	-0.93	0.0453	-0.0004	-0.14	CI

Summary Statistics

	Sample M31		Sample M32	
Grand Means	0.0488	Percent	0.0458	Percent
Std Dev Btwn Labs	0.0032	Percent	0.0032	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 50 of 59 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 180
Chemical Analysis Element #1 - Corrosion Resistant Steel - Percent
CARBON (C)

Comments on assigned Data Flags for Analysis #180

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
7U8WPW	X	Data for sample M31 are high. Inconsistent in testing between samples.
A3UWRD	X	Data for both samples are low. Possible Systematic error.
CVN2NW	X	Data for both samples are low. Possible Systematic error.
F2Z9PJ	X	Data for both samples are high. Possible Systematic error.
JE8NZ6	X	Data for both samples are high. Possible Systematic error. Inconsistent within the determinations of both samples.
LXDNAG	X	Data for sample M31 are high. Inconsistent in testing between samples.
MK8UH6	X	Data for sample M32 are high. Inconsistent in testing between samples. Inconsistent within the determinations of sample M31.
WDVXQ	X	Data for both samples are low. Possible Systematic error.

Cycle 112
4th Q, 2015

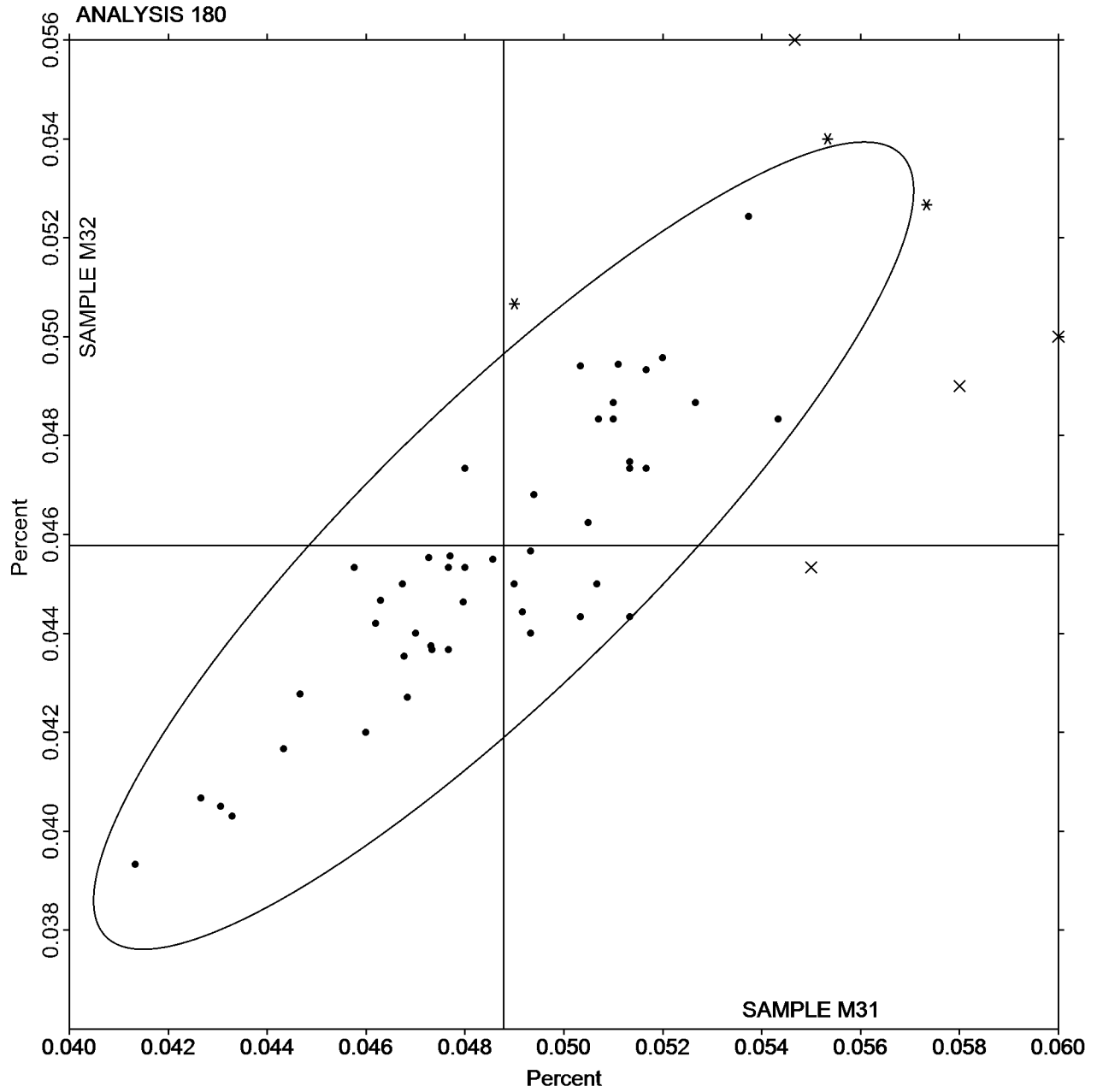
Interlaboratory Testing Program for Metals

Analysis 180

Chemical Analysis Element #1 - Corrosion Resistant Steel - Percent
CARBON (C)

SAMPLE M31
0.0488 Percent

SAMPLE M32
0.0458 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 181

Chemical Analysis Element #2 - Corrosion Resistant Steel - Percent
MANGANESE (Mn)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		1.789	0.029	1.29	1.533	0.027	1.78	IC
33UTRA		1.770	0.010	0.43	1.503	-0.003	-0.18	WD
3H4G3P		1.768	0.007	0.33	1.520	0.013	0.90	OE
4B636U	*	1.820	0.060	2.66	1.550	0.044	2.91	IC
4ENAGB		1.764	0.004	0.16	1.503	-0.003	-0.19	WD
4FH33L	X	1.833	0.073	3.25	1.480	-0.026	-1.74	OE
4FXEUY		1.745	-0.015	-0.67	1.501	-0.005	-0.32	WD
4RBLHC		1.746	-0.014	-0.64	1.490	-0.017	-1.10	OE
7QM6C9		1.753	-0.007	-0.31	1.503	-0.003	-0.19	GD
7U8WPW		1.740	-0.020	-0.91	1.473	-0.033	-2.18	OE
8BQC4D	*	1.723	-0.037	-1.65	1.513	0.007	0.48	OE
92HXX6		1.754	-0.006	-0.28	1.511	0.005	0.34	WD
9FHNTG		1.712	-0.049	-2.17	1.490	-0.017	-1.10	OE
9FHNV3		1.763	0.002	0.10	1.502	-0.005	-0.30	IC
A3UWRD		1.768	0.007	0.33	1.505	-0.001	-0.08	WD
AFJTVW		1.737	-0.024	-1.06	1.503	-0.003	-0.19	OE
AQEZQG		1.794	0.034	1.51	1.535	0.029	1.92	OE
BEHMLG		1.799	0.038	1.71	1.509	0.003	0.19	IC
CBV64V		1.750	-0.011	-0.48	1.491	-0.015	-0.99	WD
CVN2NW		1.772	0.012	0.53	1.521	0.015	0.99	OE
DAVP2H		1.777	0.016	0.73	1.527	0.020	1.36	GD
DNEANX		1.762	0.002	0.07	1.503	-0.003	-0.21	OE
DQ694G		1.751	-0.009	-0.42	1.510	0.004	0.25	XX
DVH8HV		1.763	0.003	0.12	1.506	0.000	-0.02	OE
EUYU6H		1.780	0.020	0.88	1.510	0.004	0.25	OE
EYCN8U		1.770	0.010	0.43	1.507	0.000	0.03	WD
F2Z9PJ	X	1.970	0.210	9.35	1.577	0.070	4.69	OE
FMFW42		1.761	0.001	0.04	1.511	0.005	0.34	WD
FPKEEQ		1.733	-0.027	-1.22	1.501	-0.005	-0.32	OE
GA4QPT	*	1.705	-0.055	-2.47	1.463	-0.043	-2.87	OE
GEYKMU		1.813	0.053	2.36	1.523	0.017	1.14	DR
GFAA2Z	*	1.811	0.051	2.26	1.519	0.013	0.88	OE
GTLQXX		1.770	0.010	0.43	1.517	0.010	0.70	XR
H6PHTG		1.759	-0.001	-0.05	1.495	-0.012	-0.76	OE
J8TMT9		1.746	-0.014	-0.64	1.503	-0.003	-0.19	OE
JCNGPN		1.764	0.003	0.15	1.508	0.001	0.10	OE
JE8NZ6	X	1.683	-0.077	-3.44	1.757	0.250	16.65	ED
JK34ZD		1.760	0.000	-0.02	1.517	0.010	0.70	OE
L93EYU		1.750	-0.010	-0.46	1.490	-0.016	-1.07	OE
LTN7XQ		1.760	0.000	-0.02	1.497	-0.010	-0.63	OE
LXDNAG		1.753	-0.007	-0.31	1.510	0.004	0.25	OE
MFGK97		1.759	-0.001	-0.06	1.498	-0.009	-0.57	OE
MK8UH6		1.748	-0.013	-0.57	1.497	-0.009	-0.59	OE
NN2B94		1.766	0.006	0.25	1.506	0.000	0.01	OE
PNZME7		1.750	-0.010	-0.46	1.493	-0.013	-0.85	OE
QE64D4	X	1.859	0.098	4.39	1.583	0.077	5.11	OE
QQJC2G	X	1.877	0.116	5.19	1.573	0.067	4.46	GD
QQJCZV	X	1.594	-0.166	-7.41	1.773	0.266	17.72	DR
QUJCD8		1.753	-0.007	-0.31	1.497	-0.010	-0.63	OE

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 181

Chemical Analysis Element #2 - Corrosion Resistant Steel - Percent
MANGANESE (Mn)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QZAX8E		1.729	-0.031	-1.40	1.484	-0.023	-1.50	OE
RWP8JV	X	2.087	0.326	14.56	1.803	0.297	19.75	OE
TFU3UY		1.773	0.013	0.58	1.530	0.024	1.58	OE
TMQ8D2	X	1.763	0.003	0.13	1.607	0.101	6.70	ED
TV9F2X		1.753	-0.007	-0.31	1.510	0.004	0.25	WD
U97YXF		1.746	-0.014	-0.64	1.501	-0.005	-0.32	OE
VDGAQA		1.767	0.006	0.28	1.520	0.014	0.92	OE
VGGKLA		1.759	-0.001	-0.05	1.494	-0.012	-0.81	OE
WDWVXQ		1.767	0.007	0.30	1.504	-0.003	-0.17	WD
WZ7YYE	X	1.553	-0.207	-9.24	1.300	-0.206	-13.71	ED
WZBJLG		1.753	-0.007	-0.31	1.507	0.000	0.03	XX
X9HM4Z	X	1.797	0.036	1.62	1.473	-0.033	-2.18	AA

Summary Statistics

	Sample M31		Sample M32	
Grand Means	1.760	Percent	1.506	Percent
Std Dev Btwn Labs	0.022	Percent	0.015	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 51 of 61 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 181
Chemical Analysis Element #2 - Corrosion Resistant Steel - Percent
MANGANESE (Mn)

Comments on assigned Data Flags for Analysis #181

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
4FH33L	X	Data for sample M31 are high.
F2Z9PJ	X	Data for both samples are high.
JE8NZ6	X	Data for sample M31 are low and data for sample M32 are high. Inconsistent within the determinations of both samples.
QE64D4	X	Data for both samples are high.
QQJC2G	X	Data for both samples are high. Inconsistent within the determinations of both samples.
QQJCZV	X	Data for sample M31 are low and data for sample M32 are high.
RWP8JV	X	Data for both samples are high.
TMQ8D2	X	Data for sample M32 are high.
WZ7YYE	X	Data for both samples are low. Inconsistent within the determinations of both samples.
X9HM4Z	X	Inconsistent in testing between samples. Inconsistent within the determinations of sample M32.

Cycle 112
4th Q, 2015

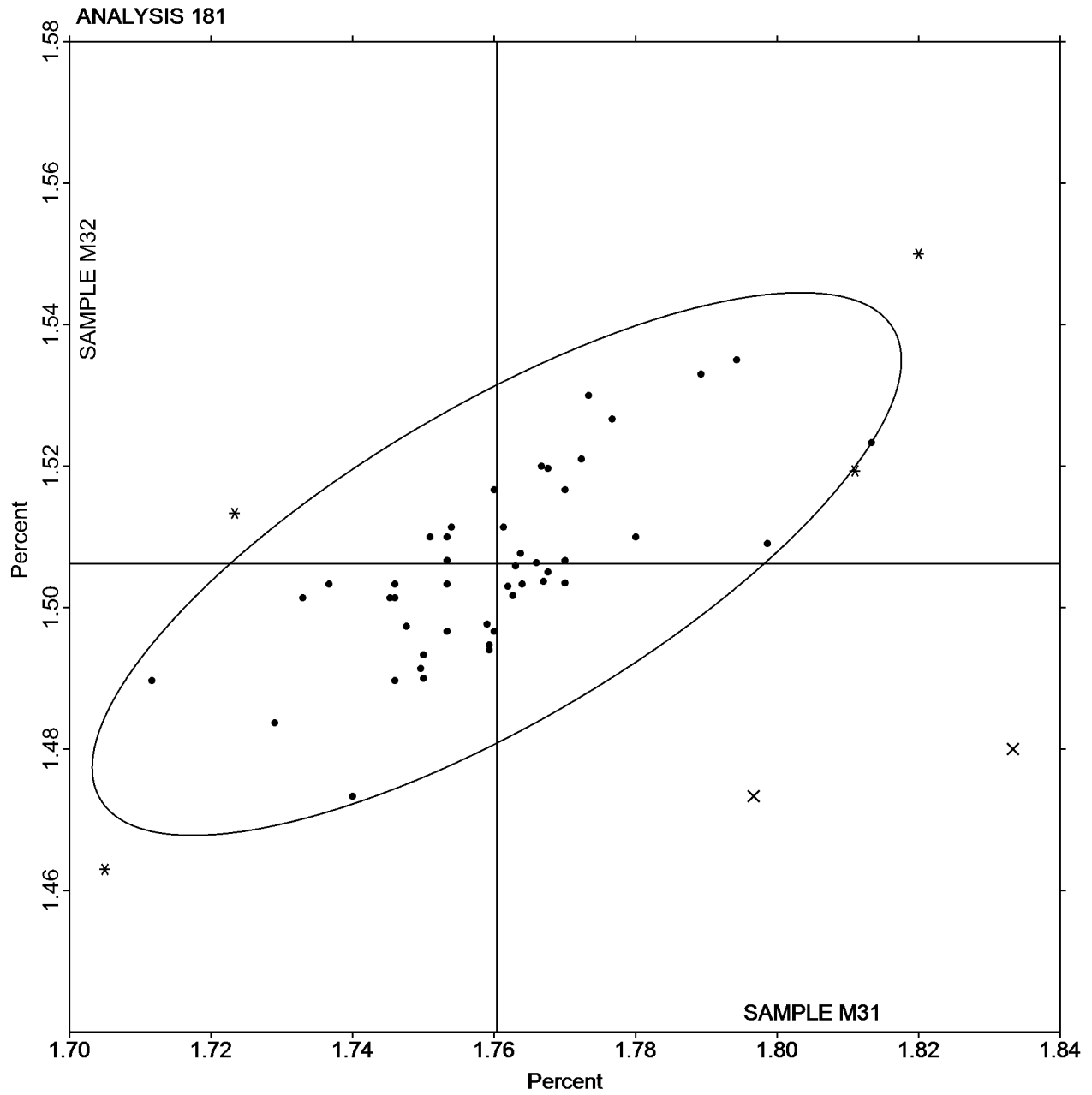
Interlaboratory Testing Program for Metals

Analysis 181

Chemical Analysis Element #2 - Corrosion Resistant Steel - Percent
MANGANESE (Mn)

SAMPLE M31
1.760 Percent

SAMPLE M32
1.506 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 182

Chemical Analysis Element #3 - Corrosion Resistant Steel - Percent
PHOSPHORUS (P)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.0213	0.0003	0.19	0.0299	0.0014	0.56	IC
33UTRA		0.0219	0.0010	0.54	0.0292	0.0007	0.29	WD
3H4G3P		0.0196	-0.0013	-0.72	0.0264	-0.0021	-0.87	OE
4B636U		0.0190	-0.0019	-1.08	0.0250	-0.0035	-1.44	IC
4ENAGB		0.0211	0.0002	0.10	0.0287	0.0002	0.08	WD
4FH33L		0.0227	0.0017	0.98	0.0320	0.0035	1.43	OE
4FXEUY		0.0212	0.0002	0.14	0.0298	0.0013	0.52	WD
4RBLHC		0.0224	0.0015	0.84	0.0307	0.0022	0.90	OE
7QM6C9		0.0223	0.0014	0.79	0.0280	-0.0005	-0.21	GD
7U8WPW		0.0212	0.0003	0.17	0.0278	-0.0007	-0.28	OE
92HXX6		0.0210	0.0001	0.04	0.0273	-0.0012	-0.49	OE
9FHNTG		0.0197	-0.0013	-0.70	0.0270	-0.0015	-0.62	OE
9FHNV3		0.0215	0.0006	0.34	0.0288	0.0003	0.13	IC
A3UWRD		0.0228	0.0018	1.03	0.0310	0.0025	1.04	WD
AFJTVW		0.0223	0.0014	0.79	0.0311	0.0026	1.08	OE
AQEZQG		0.0197	-0.0013	-0.70	0.0257	-0.0028	-1.17	OE
BEHMLG		0.0210	0.0000	0.02	0.0286	0.0001	0.05	IC
CBV64V		0.0243	0.0033	1.87	0.0308	0.0023	0.93	WD
CVN2NW	*	0.0198	-0.0012	-0.65	0.0318	0.0033	1.35	OE
DAVP2H		0.0207	-0.0003	-0.14	0.0273	-0.0012	-0.49	GD
DNEANX		0.0219	0.0010	0.55	0.0290	0.0005	0.19	OE
DQ694G		0.0207	-0.0003	-0.14	0.0293	0.0008	0.34	XX
DVH8HV		0.0168	-0.0041	-2.31	0.0227	-0.0058	-2.40	OE
EUYU6H		0.0201	-0.0009	-0.48	0.0287	0.0002	0.08	OE
EYCN8U		0.0230	0.0021	1.16	0.0300	0.0015	0.61	WD
F2Z9PJ	*	0.0163	-0.0046	-2.57	0.0233	-0.0052	-2.13	OE
FMFW42		0.0216	0.0007	0.38	0.0300	0.0015	0.61	WD
FPKEEQ		0.0211	0.0002	0.12	0.0293	0.0008	0.32	OE
GA4QPT		0.0218	0.0009	0.51	0.0293	0.0008	0.32	OE
GEYKMU		0.0230	0.0021	1.16	0.0303	0.0018	0.75	DR
GFAA2Z		0.0212	0.0002	0.14	0.0325	0.0040	1.62	OE
GTLQXX		0.0210	0.0001	0.04	0.0290	0.0005	0.20	XR
H6PHTG		0.0217	0.0007	0.42	0.0310	0.0025	1.02	OE
J8TMT9		0.0178	-0.0031	-1.75	0.0264	-0.0021	-0.88	OE
JCNGPN		0.0204	-0.0005	-0.29	0.0279	-0.0006	-0.27	OE
JE8NZ6	X	0.0400	0.0191	10.68	0.0567	0.0282	11.57	ED
JK34ZD		0.0177	-0.0033	-1.82	0.0267	-0.0018	-0.76	OE
L93EYU	X	0.0307	0.0097	5.45	0.0410	0.0125	5.13	OE
LTN7XQ		0.0217	0.0007	0.42	0.0310	0.0025	1.02	OE
LXDNAG		0.0203	-0.0006	-0.33	0.0273	-0.0012	-0.49	OE
MFGK97	*	0.0257	0.0047	2.65	0.0317	0.0032	1.30	OE
MK8UH6		0.0206	-0.0003	-0.18	0.0305	0.0020	0.80	OE
NN2B94		0.0197	-0.0013	-0.70	0.0290	0.0005	0.20	OE
PNZME7	X	0.0104	-0.0105	-5.89	0.0163	-0.0122	-5.03	OE
QE64D4	*	0.0177	-0.0033	-1.82	0.0217	-0.0068	-2.81	OE
QQJC2G	*	0.0234	0.0025	1.39	0.0278	-0.0007	-0.29	GD
QUJCD8		0.0206	-0.0003	-0.18	0.0279	-0.0006	-0.25	OE
QZAX8E		0.0172	-0.0037	-2.08	0.0230	-0.0055	-2.27	OE
RWP8JV		0.0217	0.0007	0.42	0.0300	0.0015	0.61	OE

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 182

Chemical Analysis Element #3 - Corrosion Resistant Steel - Percent PHOSPHORUS (P)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
TFU3UY		0.0209	-0.0001	-0.03	0.0263	-0.0022	-0.92	OE
TV9F2X		0.0210	0.0001	0.04	0.0297	0.0012	0.47	OE
U97YXF		0.0226	0.0016	0.92	0.0315	0.0030	1.21	OE
VDGAQA		0.0197	-0.0013	-0.70	0.0270	-0.0015	-0.62	OE
VGGKLA		0.0209	-0.0001	-0.03	0.0259	-0.0026	-1.06	OE
WDWVXQ		0.0221	0.0012	0.66	0.0299	0.0014	0.57	WD
WZBJLG		0.0217	0.0007	0.42	0.0300	0.0015	0.61	XX
X9HM4Z		0.0213	0.0004	0.23	0.0273	-0.0012	-0.49	IC

Summary Statistics

	Sample M31		Sample M32	
Grand Means	0.0209	Percent	0.0285	Percent
Std Dev Btwn Labs	0.0018	Percent	0.0024	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 54 of 57 reporting participants

Comments on assigned Data Flags for Analysis #182

WebCode Flag Analyst Comment

JE8NZ6 X Data for both samples are high. Inconsistent within the determinations of both samples.

L93EYU X Data for both samples are high. Inconsistent within the determinations of sample M32.

PNZME7 X Data for both samples are low.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 183

Chemical Analysis Element #4 - Corrosion Resistant Steel - Percent
TITANIUM (Ti)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.5887	-0.0003	-0.01	0.3348	0.0086	0.55	IC
33UTRA		0.6249	0.0359	1.70	0.3387	0.0124	0.79	WD
3H4G3P		0.5873	-0.0017	-0.08	0.3160	-0.0102	-0.65	OE
4B636U		0.6103	0.0213	1.01	0.3483	0.0221	1.41	IC
4ENAGB		0.5983	0.0093	0.44	0.3380	0.0118	0.75	WD
4FH33L		0.5733	-0.0157	-0.74	0.3233	-0.0029	-0.19	OE
4FXEUY		0.5953	0.0063	0.30	0.3353	0.0091	0.58	WD
4RBLHC		0.5930	0.0040	0.19	0.3257	-0.0006	-0.04	OE
7QM6C9		0.5707	-0.0183	-0.87	0.3007	-0.0256	-1.63	GD
7U8WPW		0.5900	0.0010	0.05	0.3300	0.0038	0.24	OE
8BQC4D		0.5933	0.0043	0.21	0.3483	0.0221	1.41	OE
92HXX6		0.5977	0.0087	0.41	0.3283	0.0021	0.13	WD
9FHNTG		0.5683	-0.0207	-0.98	0.2917	-0.0346	-2.21	OE
9FHNV3		0.5847	-0.0043	-0.21	0.3237	-0.0026	-0.16	IC
A3UWRD		0.5977	0.0087	0.41	0.3317	0.0054	0.35	WD
AFJTVW		0.5983	0.0093	0.44	0.3270	0.0008	0.05	OE
AQEZQG		0.6007	0.0117	0.55	0.3487	0.0224	1.43	OE
BEHMLG		0.5610	-0.0280	-1.33	0.3347	0.0084	0.54	IC
CBV64V		0.6353	0.0463	2.20	0.3393	0.0131	0.84	WD
CVN2NW	X	0.6940	0.1050	4.98	0.3690	0.0428	2.73	OE
DAVP2H	X	0.4930	-0.0960	-4.55	0.2567	-0.0696	-4.45	GD
DNEANX		0.5873	-0.0017	-0.08	0.3207	-0.0056	-0.36	OE
DQ694G	X	0.3780	-0.2110	-10.00	0.2137	-0.1126	-7.20	XX
DVH8HV		0.5784	-0.0106	-0.50	0.3222	-0.0040	-0.26	XX
EUYU6H		0.5873	-0.0017	-0.08	0.2997	-0.0266	-1.70	OE
EYCN8U		0.5967	0.0077	0.36	0.3283	0.0021	0.13	WD
F2Z9PJ	*	0.5267	-0.0623	-2.96	0.2920	-0.0342	-2.19	OE
FMFW42		0.5937	0.0047	0.22	0.3430	0.0168	1.07	WD
FPKEEQ		0.5463	-0.0427	-2.02	0.2967	-0.0296	-1.89	OE
GA4QPT		0.5900	0.0010	0.05	0.3240	-0.0022	-0.14	OE
GEYKMU		0.5863	-0.0027	-0.13	0.3260	-0.0002	-0.01	DR
GFAA2Z	*	0.5983	0.0093	0.44	0.3010	-0.0252	-1.61	OE
GTLQXX		0.6203	0.0313	1.49	0.3417	0.0154	0.99	XR
H6PHTG		0.5953	0.0063	0.30	0.3263	0.0001	0.01	OE
J8TMT9		0.6267	0.0377	1.79	0.3530	0.0268	1.71	OE
JCNGPN		0.5966	0.0076	0.36	0.3394	0.0131	0.84	OE
JE8NZ6	X	0.7233	0.1343	6.37	0.2833	-0.0429	-2.74	ED
JK34ZD		0.5760	-0.0130	-0.62	0.3217	-0.0046	-0.29	OE
L93EYU	X	0.6280	0.0390	1.85	0.3057	-0.0206	-1.31	OE
LARLEK	X	0.6170	0.0280	1.33	0.3810	0.0548	3.50	ED
LTN7XQ		0.5720	-0.0170	-0.81	0.3410	0.0148	0.94	OE
LXDNAG		0.5867	-0.0023	-0.11	0.3267	0.0004	0.03	OE
MFGK97		0.5733	-0.0157	-0.74	0.3193	-0.0069	-0.44	OE
MK8UH6		0.5903	0.0013	0.06	0.3200	-0.0062	-0.40	XX
NN2B94		0.6063	0.0173	0.82	0.3363	0.0101	0.65	OE
PNZME7	X	0.6663	0.0773	3.67	0.3330	0.0068	0.43	OE
QE64D4	X	0.4850	-0.1040	-4.93	0.2637	-0.0626	-4.00	OE
QQJC2G		0.5493	-0.0397	-1.88	0.3063	-0.0199	-1.27	GD
QQJCZV	X	0.3663	-0.2227	-10.56	0.5737	0.2474	15.82	DR

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 183

Chemical Analysis Element #4 - Corrosion Resistant Steel - Percent
TITANIUM (Ti)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QUJCD8		0.5747	-0.0143	-0.68	0.3183	-0.0079	-0.51	OE
QZAX8E		0.5763	-0.0127	-0.60	0.3293	0.0031	0.20	OE
RWP8JV		0.5867	-0.0023	-0.11	0.3487	0.0224	1.43	OE
TFU3UY	X	0.2420	-0.3470	-16.45	0.1187	-0.2076	-13.27	OE
TMQ8D2	X	0.5258	-0.0632	-3.00	0.2312	-0.0950	-6.07	ED
TV9F2X		0.5860	-0.0030	-0.14	0.3213	-0.0049	-0.31	WD
U97YXF		0.6143	0.0253	1.20	0.3373	0.0111	0.71	OE
VGGKLA		0.6373	0.0483	2.29	0.3423	0.0161	1.03	OE
WDWVXQ		0.5933	0.0043	0.21	0.3280	0.0018	0.11	WD
WZ7YYE		0.5567	-0.0323	-1.53	0.2967	-0.0296	-1.89	ED
WZBJLG		0.5817	-0.0073	-0.35	0.3103	-0.0159	-1.02	XX
X9HM4Z		0.5900	0.0010	0.05	0.3300	0.0038	0.24	AA

Summary Statistics

	Sample M31		Sample M32	
Grand Means	0.5890	Percent	0.3262	Percent
Std Dev Btwn Labs	0.0211	Percent	0.0156	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 50 of 61 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 183
Chemical Analysis Element #4 - Corrosion Resistant Steel - Percent
TITANIUM (Ti)

Comments on assigned Data Flags for Analysis #183

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
CVN2NW	X	Data for both samples are high.
DAVP2H	X	Data for both samples are low.
DQ694G	X	Data for both samples are low.
JE8NZ6	X	Data for sample M31 are high and data for sample M32 are low. Inconsistent within the determinations of both samples.
L93EYU	X	Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
LARLEK	X	Data for sample M32 are high. Inconsistent within the determinations of sample M31.
PNZME7	X	Data for sample M31 are high.
QE64D4	X	Data for both samples are low.
QQJCZV	X	Data for sample M31 are low and data for sample M32 are high.
TFU3UY	X	Data for both samples are low.
TMQ8D2	X	Data for both samples are low.

Cycle 112
4th Q, 2015

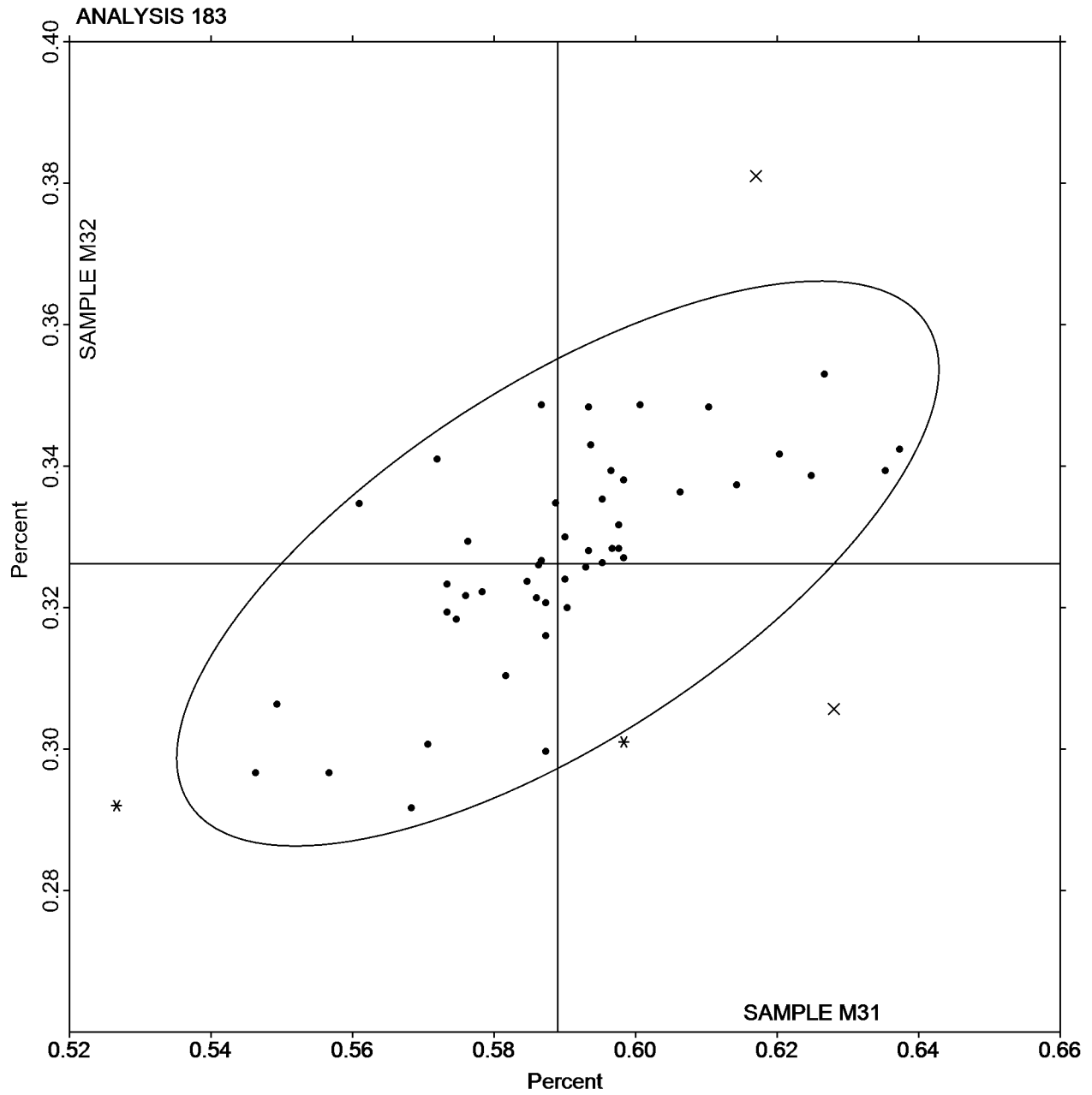
Interlaboratory Testing Program for Metals

Analysis 183

Chemical Analysis Element #4 - Corrosion Resistant Steel - Percent
TITANIUM (Ti)

SAMPLE M31
0.5890 Percent

SAMPLE M32
0.3262 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 184

Chemical Analysis Element #5 - Corrosion Resistant Steel - Percent
SILICON (Si)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.3134	-0.0137	-1.08	0.6255	0.0009	0.05	IC
33UTRA		0.3363	0.0092	0.72	0.6333	0.0087	0.51	OE
3H4G3P		0.3220	-0.0051	-0.40	0.6200	-0.0046	-0.27	OE
4B636U		0.3467	0.0196	1.53	0.6467	0.0221	1.30	IC
4ENAGB		0.3180	-0.0091	-0.71	0.6193	-0.0053	-0.31	WD
4FH33L	*	0.3400	0.0129	1.01	0.6000	-0.0246	-1.45	OE
4FXEUY		0.3180	-0.0091	-0.71	0.6330	0.0084	0.49	WD
4RBLHC		0.3287	0.0016	0.12	0.6163	-0.0083	-0.49	OE
7QM6C9		0.3067	-0.0204	-1.60	0.5880	-0.0366	-2.15	GD
7U8WPW		0.3227	-0.0044	-0.35	0.5917	-0.0329	-1.94	OE
8BQC4D	X	0.3693	0.0422	3.31	0.5867	-0.0379	-2.23	OE
92HXX6		0.3277	0.0006	0.04	0.6210	-0.0036	-0.21	OE
9FHNTG	X	0.2850	-0.0421	-3.30	0.6197	-0.0049	-0.29	OE
9FHNV3		0.3207	-0.0064	-0.51	0.6337	0.0091	0.53	IC
A3UWRD		0.3090	-0.0181	-1.42	0.6133	-0.0113	-0.66	WD
AFJTVW		0.3360	0.0089	0.70	0.6193	-0.0053	-0.31	OE
AQEZQG		0.3400	0.0129	1.01	0.6407	0.0161	0.94	OE
BEHMLG		0.3230	-0.0041	-0.32	0.6170	-0.0076	-0.45	IC
CBV64V		0.3423	0.0152	1.19	0.6597	0.0351	2.06	WD
CVN2NW		0.3290	0.0019	0.15	0.6197	-0.0049	-0.29	OE
DAVP2H		0.3323	0.0052	0.41	0.6263	0.0017	0.10	GD
DNEANX		0.3273	0.0002	0.02	0.6303	0.0057	0.34	OE
DQ694G		0.3470	0.0199	1.56	0.6240	-0.0006	-0.04	XX
DVH8HV		0.3324	0.0053	0.41	0.6325	0.0079	0.46	OE
EUYU6H		0.3383	0.0112	0.88	0.6403	0.0157	0.93	OE
EYCN8U		0.3400	0.0129	1.01	0.6400	0.0154	0.91	WD
F2Z9PJ		0.3273	0.0002	0.02	0.6000	-0.0246	-1.45	OE
FMFW42		0.3280	0.0009	0.07	0.6310	0.0064	0.38	WD
FPKEEQ		0.3123	-0.0148	-1.16	0.5970	-0.0276	-1.62	OE
GA4QPT		0.3070	-0.0201	-1.58	0.6080	-0.0166	-0.98	OE
GEYKMU		0.3267	-0.0004	-0.03	0.6190	-0.0056	-0.33	DR
GFAA2Z		0.3147	-0.0124	-0.98	0.6363	0.0117	0.69	OE
GTLQXX		0.3130	-0.0141	-1.11	0.6160	-0.0086	-0.51	XR
H6PHTG		0.3173	-0.0098	-0.77	0.6317	0.0071	0.42	OE
J8TMT9		0.3497	0.0226	1.77	0.6410	0.0164	0.96	OE
JCNGPN		0.3190	-0.0081	-0.63	0.6185	-0.0061	-0.36	OE
JE8NZ6	X	0.3733	0.0462	3.63	0.6933	0.0687	4.04	ED
JK34ZD		0.3070	-0.0201	-1.58	0.5967	-0.0279	-1.64	OE
L93EYU	X	0.3793	0.0522	4.10	0.6000	-0.0246	-1.45	OE
LTN7XQ		0.3163	-0.0108	-0.85	0.6397	0.0151	0.89	OE
LXDNAG		0.3467	0.0196	1.53	0.6433	0.0187	1.10	OE
MFGK97		0.3273	0.0002	0.02	0.6227	-0.0019	-0.11	OE
MK8UH6		0.3463	0.0192	1.51	0.6340	0.0094	0.55	OE
NN2B94		0.3233	-0.0038	-0.30	0.6277	0.0031	0.18	OE
PNZME7	*	0.3583	0.0312	2.45	0.6610	0.0364	2.14	OE
QE64D4	X	0.2993	-0.0278	-2.18	0.5367	-0.0879	-5.17	OE
QQJC2G		0.3400	0.0129	1.01	0.6293	0.0047	0.28	GD
QQJCZV	X	0.5040	0.1769	13.88	0.3370	-0.2876	-16.92	DR
QUJCD8		0.3197	-0.0074	-0.58	0.6023	-0.0223	-1.31	OE

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 184

Chemical Analysis Element #5 - Corrosion Resistant Steel - Percent SILICON (Si)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QZAX8E		0.3313	0.0042	0.33	0.6330	0.0084	0.49	OE
RWP8JV		0.3117	-0.0154	-1.21	0.6367	0.0121	0.71	OE
TFU3UY		0.3423	0.0152	1.19	0.6293	0.0047	0.28	OE
TMQ8D2		0.3171	-0.0100	-0.79	0.6042	-0.0204	-1.20	ED
TV9F2X		0.3180	-0.0091	-0.71	0.6190	-0.0056	-0.33	WD
U97YXF		0.3163	-0.0108	-0.85	0.6160	-0.0086	-0.51	OE
VDGAQA		0.3303	0.0032	0.25	0.6417	0.0171	1.00	OE
VGGKLA		0.3090	-0.0181	-1.42	0.5823	-0.0423	-2.49	OE
WDWVXQ		0.3177	-0.0094	-0.74	0.6393	0.0147	0.87	WD
WZ7YYE	M	No Data Reported			0.1967	-0.4279	-25.18	ED
WZBJLG		0.3327	0.0056	0.44	0.6403	0.0157	0.93	XX
X9HM4Z		0.3400	0.0129	1.01	0.6400	0.0154	0.91	AA

Summary Statistics				
	Sample M31		Sample M32	
Grand Means	0.3271	Percent	0.6246	Percent
Std Dev Btwn Labs	0.0127	Percent	0.0170	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 54 of 61 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 184
Chemical Analysis Element #5 - Corrosion Resistant Steel - Percent
SILICON (Si)

Comments on assigned Data Flags for Analysis #184

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
8BQC4D	X	Data for sample M31 are high.
9FHNTG	X	Data for sample M31 are low. Inconsistent within the determinations of sample M32.
JE8NZ6	X	Data for both samples are high. Inconsistent within the determinations of both samples.
L93EYU	X	Data for sample M31 are high. Inconsistent within the determinations of sample M32.
QE64D4	X	Data for sample M32 are low.
QQJCZV	X	Data for sample M31 are high and data for sample M32 are low.
WZ7YYE	M	Laboratory did not submit data for sample M31. Inconsistent within the determinations of sample M32.

Cycle 112
4th Q, 2015

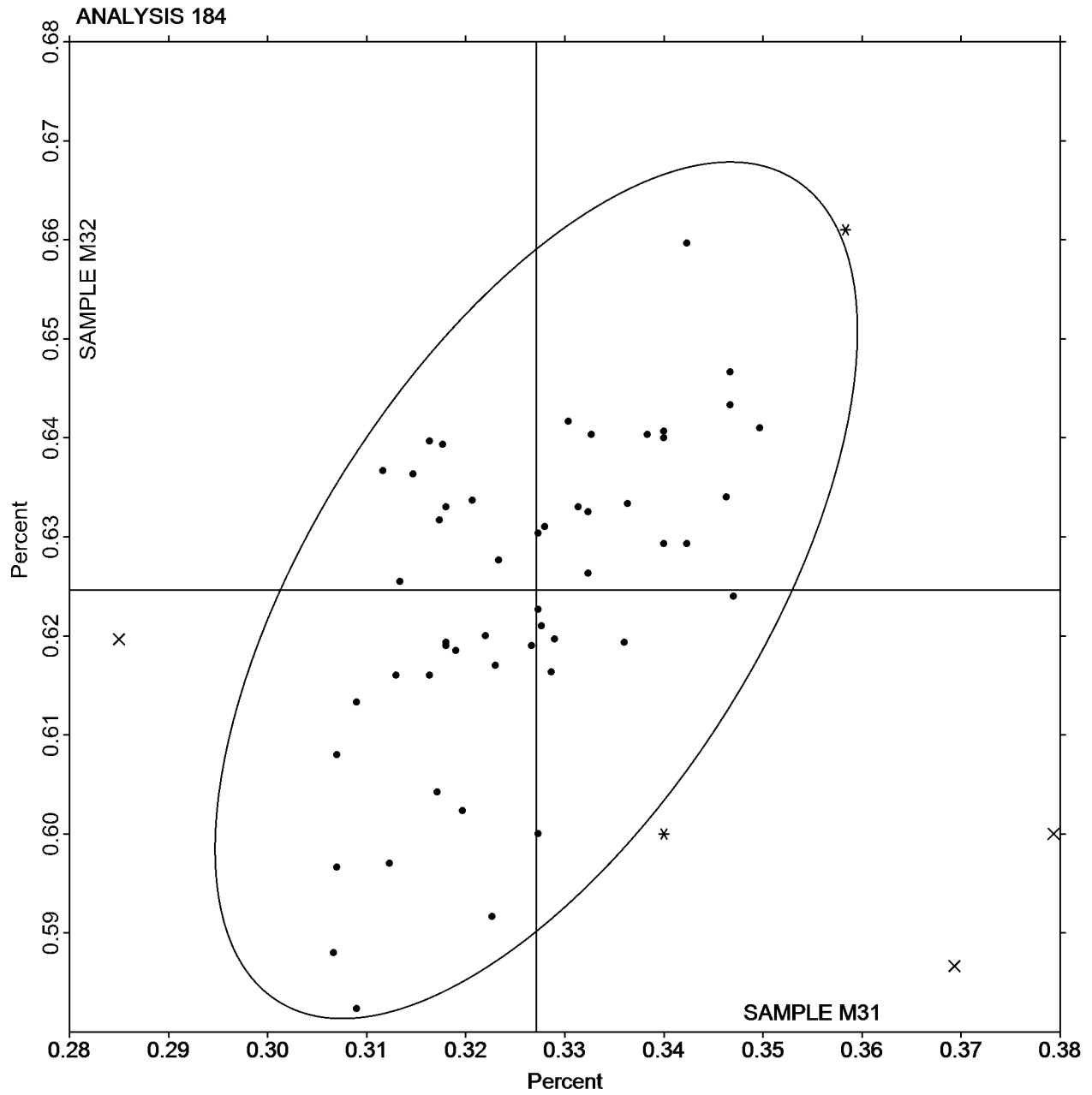
Interlaboratory Testing Program for Metals

Analysis 184

Chemical Analysis Element #5 - Corrosion Resistant Steel - Percent SILICON (Si)

SAMPLE M31
0.3271 Percent

SAMPLE M32
0.6246 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 185

Chemical Analysis Element #6 - Corrosion Resistant Steel - Percent
NITROGEN (N)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.0141	-0.0014	-0.21	0.0103	-0.0034	-0.51	CO
33UTRA		0.0160	0.0005	0.07	0.0138	0.0001	0.02	CI
3H4G3P		0.0113	-0.0042	-0.62	0.0116	-0.0020	-0.31	OE
4B636U		0.0123	-0.0032	-0.47	0.0115	-0.0022	-0.33	XX
4ENAGB		0.00987	-0.0057	-0.83	0.0104	-0.0033	-0.50	CI
4FXEUY		0.0132	-0.0023	-0.33	0.0105	-0.0032	-0.49	CO
4RBLHC		0.0165	0.0009	0.14	0.0141	0.0004	0.07	OE
92HXX6		0.00633	-0.0092	-1.34	0.00633	-0.0073	-1.12	XX
9FHNTG	X	0.0480	0.0325	4.74	0.0370	0.0233	3.55	OE
9FHNV3		0.0108	-0.0047	-0.68	0.0110	-0.0027	-0.41	CO
A3UWRD	*	0.0267	0.0112	1.63	0.0143	0.0007	0.10	CI
AQEZQG		0.0247	0.0092	1.34	0.0258	0.0121	1.85	OE
CBV64V		0.0143	-0.0012	-0.17	0.0117	-0.0020	-0.30	CO
DNEANX		0.0114	-0.0041	-0.60	0.0110	-0.0027	-0.41	OE
DQ694G	*	0.0293	0.0138	2.01	0.0310	0.0173	2.64	XX
DVH8HV		0.0122	-0.0034	-0.49	0.00837	-0.0053	-0.81	OE
EUYU6H		0.00600	-0.0095	-1.39	0.00590	-0.0078	-1.18	OE
EYCN8U		0.00867	-0.0069	-1.00	0.0110	-0.0027	-0.41	OE
FMFW42		0.0114	-0.0041	-0.60	0.0108	-0.0028	-0.43	CI
GA4QPT		0.0161	0.0005	0.08	0.0136	-0.0001	-0.01	CI
GTLQXX		0.0114	-0.0042	-0.61	0.0125	-0.0011	-0.17	IR
H6PHTG		0.0117	-0.0039	-0.56	0.00967	-0.0040	-0.61	CI
JCNGPN		0.00943	-0.0061	-0.89	0.00980	-0.0039	-0.59	OE
JE8NZ6	X	0.2333	0.2178	31.77	0.1400	0.1263	19.24	ED
MFGK97		0.0117	-0.0039	-0.56	0.0113	-0.0023	-0.36	CO
MK8UH6		0.0189	0.0034	0.50	0.0139	0.0003	0.04	OE
NN2B94		0.0122	-0.0033	-0.48	0.0118	-0.0019	-0.29	XX
PNZME7		0.0287	0.0132	1.92	0.0265	0.0129	1.96	XX
QUJCD8		0.0123	-0.0033	-0.48	0.0121	-0.0016	-0.24	OE
QZAX8E		0.0143	-0.0012	-0.17	0.00797	-0.0057	-0.87	OE
TFU3UY		0.00900	-0.0065	-0.95	0.0110	-0.0027	-0.41	XX
TV9F2X		0.0157	0.0002	0.03	0.0106	-0.0030	-0.46	CO
VGGKLA		0.0307	0.0152	2.21	0.0307	0.0170	2.59	OE
WDWVXQ	*	0.0267	0.0112	1.63	0.0143	0.0007	0.10	CI
WZBJLG		0.0250	0.0095	1.38	0.0280	0.0143	2.18	XX
X9HM4Z		0.0188	0.0033	0.48	0.0115	-0.0022	-0.33	XX

Summary Statistics

	Sample M31		Sample M32	
Grand Means	0.0155	Percent	0.0137	Percent
Std Dev Btwn Labs	0.0069	Percent	0.0066	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 34 of 36 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 185
Chemical Analysis Element #6 - Corrosion Resistant Steel - Percent
NITROGEN (N)

Comments on assigned Data Flags for Analysis #185

WebCode Flag Analyst Comment

9FHNTG X Data for both samples are high. Possible Systematic error. Inconsistent within the determinations of both samples.

JE8NZ6 X Data for both samples are high. Possible Systematic error. Inconsistent within the determinations of both samples.

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 186

Chemical Analysis Element #7 - Corrosion Resistant Steel - Percent
NICKEL (Ni)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		9.229	0.039	0.44	9.042	0.040	0.43	IC
33UTRA		9.154	-0.036	-0.41	8.954	-0.048	-0.51	WD
3H4G3P		9.283	0.093	1.06	9.056	0.055	0.59	OE
4B636U		9.327	0.136	1.55	9.157	0.155	1.66	IC
4ENAGB		9.197	0.006	0.07	8.990	-0.012	-0.13	WD
4FH33L		9.207	0.016	0.19	8.963	-0.038	-0.41	OE
4FXEUY		9.091	-0.100	-1.13	8.947	-0.054	-0.58	WD
4RBLHC		9.183	-0.008	-0.09	9.029	0.027	0.29	OE
7QM6C9		9.117	-0.074	-0.84	8.833	-0.168	-1.81	GD
7U8WPW		9.170	-0.020	-0.23	8.950	-0.052	-0.56	OE
8BQC4D		9.223	0.033	0.38	9.160	0.158	1.70	OE
92HXX6		9.189	-0.002	-0.02	9.028	0.026	0.28	WD
9FHNTG	X	9.386	0.196	2.23	9.415	0.413	4.43	OE
9FHNV3		9.200	0.010	0.11	9.060	0.059	0.63	IC
A3UWRD		9.121	-0.069	-0.79	8.977	-0.024	-0.26	WD
AFJTVW		9.190	0.000	0.00	9.070	0.068	0.73	OE
AQEZQG		9.203	0.013	0.15	8.987	-0.014	-0.16	OE
BEHMLG		9.212	0.021	0.24	8.969	-0.033	-0.36	IC
CBV64V		9.116	-0.075	-0.85	8.905	-0.097	-1.04	WD
CVN2NW		9.207	0.016	0.19	8.963	-0.038	-0.41	OE
DAVP2H		9.223	0.033	0.38	9.070	0.068	0.73	GD
DNEANX		9.220	0.029	0.33	9.030	0.029	0.31	OE
DQ694G		9.227	0.037	0.42	8.983	-0.019	-0.20	XX
DVH8HV		9.289	0.099	1.12	9.153	0.151	1.63	OE
EUYU6H		9.120	-0.070	-0.80	8.923	-0.078	-0.84	OE
EYCN8U		9.168	-0.022	-0.25	8.969	-0.032	-0.35	WD
F2Z9PJ		9.103	-0.087	-0.99	8.850	-0.152	-1.63	OE
FMFW42		9.186	-0.005	-0.05	8.976	-0.026	-0.28	WD
FPKEEQ		9.307	0.116	1.32	9.083	0.082	0.88	OE
GA4QPT		9.330	0.140	1.59	9.100	0.098	1.05	OE
GEYKMU		9.307	0.117	1.33	9.042	0.040	0.43	DR
GFAA2Z		9.050	-0.141	-1.60	8.809	-0.193	-2.07	OE
GTLQXX		9.193	0.003	0.03	9.017	0.015	0.16	XR
H6PHTG		9.297	0.106	1.21	9.033	0.032	0.34	OE
J8TMT9		9.348	0.158	1.80	9.132	0.130	1.40	OE
JCNGPN		9.175	-0.015	-0.18	8.968	-0.034	-0.37	OE
JE8NZ6	X	8.053	-1.137	-12.95	7.980	-1.022	-10.97	ED
JK34ZD		9.090	-0.100	-1.14	8.893	-0.108	-1.16	OE
L93EYU		9.127	-0.064	-0.72	8.950	-0.052	-0.56	OE
LARLEK		9.089	-0.101	-1.15	9.026	0.024	0.26	ED
LTN7XQ		9.170	-0.020	-0.23	8.997	-0.005	-0.06	OE
LXDNAG		9.103	-0.087	-0.99	8.930	-0.072	-0.77	OE
MFGK97		9.078	-0.112	-1.28	8.915	-0.086	-0.93	OE
MK8UH6		9.074	-0.116	-1.32	8.860	-0.142	-1.52	OE
NN2B94		9.137	-0.054	-0.61	8.963	-0.038	-0.41	OE
PNZME7		9.117	-0.074	-0.84	8.903	-0.098	-1.06	OE
PVKT4Q		9.209	0.019	0.22	8.996	-0.006	-0.06	WC
QE64D4		9.335	0.144	1.64	9.066	0.064	0.69	OE
QQJC2G		9.270	0.080	0.91	9.103	0.102	1.09	GD

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 186

Chemical Analysis Element #7 - Corrosion Resistant Steel - Percent
NICKEL (Ni)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QQJCZV		9.179	-0.011	-0.13	9.235	0.234	2.51	DR
QUJCD8		9.140	-0.050	-0.57	8.930	-0.072	-0.77	OE
QZAX8E	*	9.444	0.254	2.89	9.258	0.257	2.75	OE
RWP8JV		9.273	0.083	0.95	9.190	0.188	2.02	OE
TFU3UY	*	9.133	-0.057	-0.65	9.117	0.115	1.23	OE
TMQ8D2		9.064	-0.127	-1.44	8.911	-0.091	-0.98	ED
TV9F2X		9.113	-0.077	-0.88	8.933	-0.068	-0.74	WD
U97YXF		9.367	0.176	2.01	9.117	0.115	1.23	OE
VDGAQA		9.010	-0.180	-2.05	8.923	-0.078	-0.84	OE
VGGKLA		9.247	0.056	0.64	9.035	0.033	0.35	OE
WDWVXQ		9.200	0.009	0.11	9.002	0.001	0.01	WD
WZ7YYE		9.203	0.013	0.15	9.120	0.118	1.27	ED
WZBJLG		9.150	-0.040	-0.46	8.877	-0.125	-1.34	XX
X9HM4Z		9.117	-0.074	-0.84	8.913	-0.088	-0.95	AA

Summary Statistics

	Sample M31		Sample M32	
Grand Means	9.190	Percent	9.002	Percent
Std Dev Btwn Labs	0.088	Percent	0.093	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 60 of 63 reporting participants

Comments on assigned Data Flags for Analysis #186

WebCode Flag Analyst Comment

9FHNTG X Data for sample M32 are high. Inconsistent in testing between samples.

JE8NZ6 X Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of both samples.

Cycle 112
4th Q, 2015

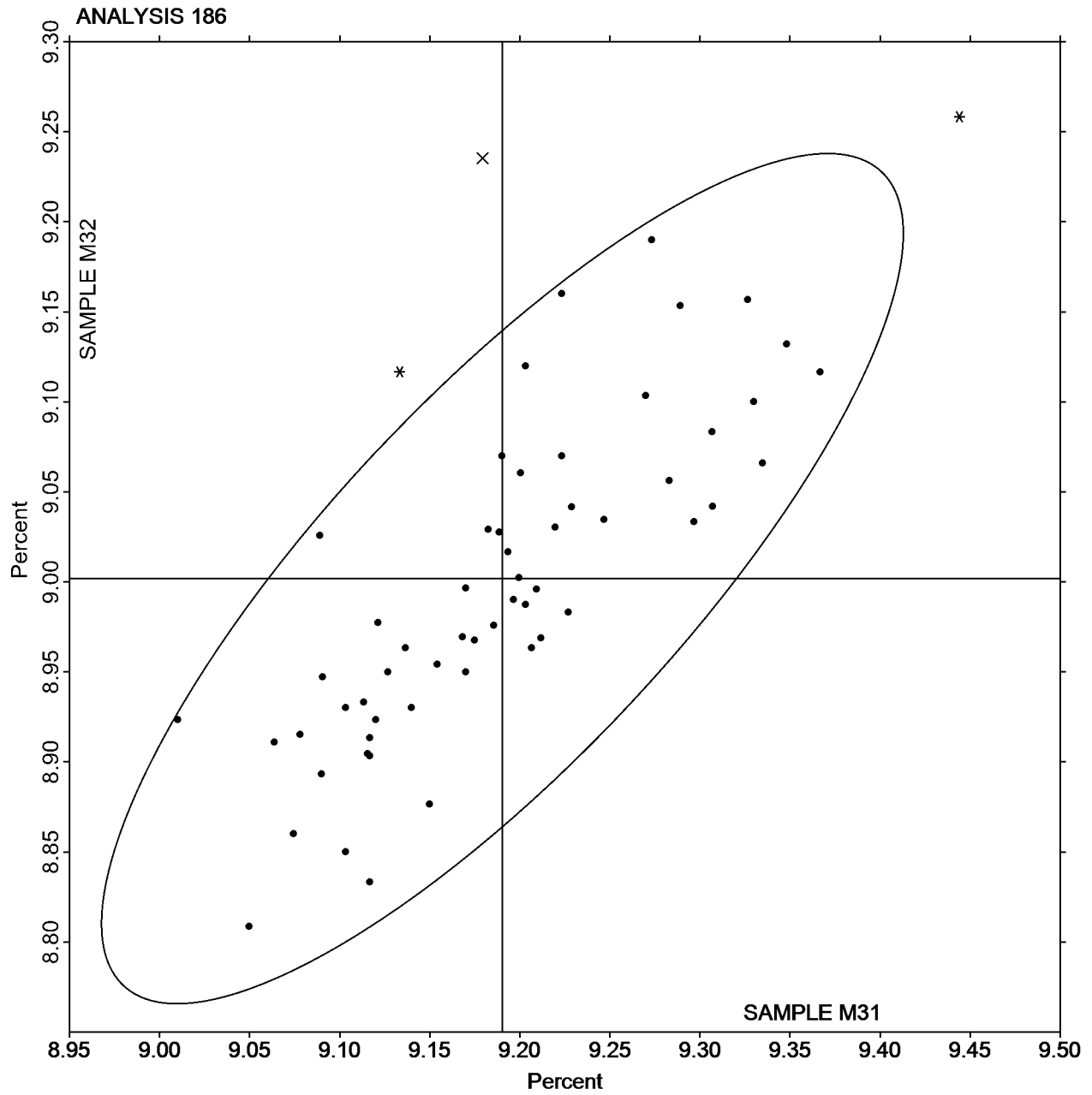
Interlaboratory Testing Program for Metals

Analysis 186

Chemical Analysis Element #7 - Corrosion Resistant Steel - Percent
NICKEL (Ni)

SAMPLE M31
9.190 Percent

SAMPLE M32
9.002 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 187

Chemical Analysis Element #8 - Corrosion Resistant Steel - Percent
CHROMIUM (Cr)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		17.80	0.01	0.12	17.73	0.02	0.15	IC
33UTRA		17.78	-0.01	-0.11	17.70	-0.02	-0.23	WD
3H4G3P		17.75	-0.04	-0.46	17.69	-0.03	-0.33	OE
4B636U		17.58	-0.21	-2.38	17.49	-0.23	-2.35	TI
4ENAGB		17.82	0.03	0.37	17.72	0.00	0.04	WD
4FH33L		17.71	-0.08	-0.95	17.65	-0.07	-0.74	OE
4FXEUY	X	17.52	-0.27	-3.10	17.69	-0.03	-0.33	WD
4RBLHC		17.77	-0.02	-0.27	17.68	-0.04	-0.37	OE
7QM6C9		17.77	-0.02	-0.27	17.63	-0.09	-0.87	GD
7U8WPW		17.82	0.03	0.34	17.74	0.02	0.21	OE
8BQC4D	*	17.63	-0.16	-1.85	17.73	0.01	0.09	OE
92HXX6		17.75	-0.04	-0.43	17.71	-0.01	-0.11	WD
9FHNTG	X	17.98	0.19	2.18	17.66	-0.06	-0.56	OE
9FHNV3		17.78	-0.01	-0.12	17.69	-0.03	-0.30	IC
A3UWRD		17.75	-0.04	-0.46	17.70	-0.02	-0.16	WD
AFJTVW		17.68	-0.11	-1.25	17.57	-0.15	-1.55	OE
AQEZQG		17.83	0.03	0.39	17.68	-0.04	-0.40	OE
BEHMLG		17.75	-0.04	-0.46	17.56	-0.16	-1.65	IC
CBV64V		17.79	0.00	0.02	17.68	-0.04	-0.43	WD
CVN2NW		17.84	0.05	0.53	17.81	0.09	0.91	OE
DAVP2H		17.87	0.08	0.87	17.73	0.01	0.14	GD
DNEANX		17.76	-0.03	-0.38	17.67	-0.05	-0.54	OE
DQ694G		17.82	0.03	0.34	17.86	0.14	1.45	XX
DVH8HV		17.79	0.00	-0.05	17.71	-0.01	-0.10	OE
EUYU6H		17.90	0.11	1.24	17.80	0.08	0.85	OE
EYCN8U		17.81	0.02	0.19	17.67	-0.05	-0.49	WD
F2Z9PJ	*	17.82	0.03	0.34	17.58	-0.14	-1.38	OE
FMFW42		17.81	0.02	0.26	17.73	0.01	0.14	WD
FPKEEQ		17.81	0.02	0.22	17.79	0.07	0.74	OE
GA4QPT		17.89	0.10	1.13	17.79	0.07	0.71	OE
GEYKMU		17.71	-0.08	-0.88	17.65	-0.07	-0.68	DR
GFAA2Z		17.72	-0.07	-0.79	17.71	-0.01	-0.10	OE
GTLQXX		17.94	0.15	1.70	17.83	0.11	1.15	XR
H6PHTG		17.88	0.09	1.05	17.75	0.03	0.27	OE
J8TMT9		17.81	0.02	0.19	17.75	0.03	0.31	OE
JCNGPN		17.77	-0.02	-0.23	17.66	-0.06	-0.57	OE
JE8NZ6	X	16.94	-0.85	-9.63	16.97	-0.75	-7.54	ED
JK34ZD		17.83	0.04	0.41	17.78	0.06	0.64	OE
L93EYU		17.76	-0.03	-0.38	17.72	0.00	0.04	OE
LARLEK		17.79	0.00	0.04	17.84	0.12	1.18	ED
LTN7XQ		17.84	0.05	0.53	17.69	-0.03	-0.30	OE
LXDNAG	X	18.27	0.48	5.39	17.90	0.18	1.82	OE
MFGK97		17.71	-0.08	-0.95	17.64	-0.08	-0.84	OE
MK8UH6		17.86	0.07	0.83	17.84	0.12	1.18	OE
NN2B94		17.83	0.04	0.49	17.75	0.03	0.27	OE
PNZME7		17.98	0.19	2.15	17.94	0.22	2.26	OE
PVKT4Q		17.73	-0.06	-0.63	17.62	-0.10	-0.99	WC
QE64D4		17.93	0.14	1.53	17.84	0.12	1.17	OE
QQJC2G		17.73	-0.06	-0.64	17.80	0.08	0.81	GD

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals

Analysis 187

Chemical Analysis Element #8 - Corrosion Resistant Steel - Percent CHROMIUM (Cr)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QQJCZV	X	17.26	-0.53	-5.99	17.69	-0.03	-0.27	DR
QUJCD8		17.94	0.15	1.70	17.92	0.20	2.06	OE
QZAX8E		17.63	-0.16	-1.85	17.48	-0.24	-2.45	OE
RWP8JV		17.61	-0.18	-2.00	17.58	-0.14	-1.44	OE
TFU3UY		17.72	-0.07	-0.76	17.64	-0.08	-0.84	OE
TMQ8D2		17.69	-0.10	-1.14	17.63	-0.09	-0.90	ED
TV9F2X	*	17.62	-0.17	-1.89	17.68	-0.04	-0.43	WD
U97YXF	X	18.19	0.40	4.56	17.99	0.27	2.70	OE
VDGAQA		17.90	0.11	1.28	17.81	0.09	0.91	OE
VGGKLA		17.95	0.16	1.81	17.86	0.14	1.42	OE
WDWVXQ		17.78	-0.01	-0.10	17.70	-0.02	-0.18	WD
WZ7YYE		17.88	0.09	0.98	17.88	0.16	1.59	ED
WZBJLG		17.85	0.06	0.64	17.82	0.10	1.05	XX
X9HM4Z	X	17.86	0.07	0.75	17.35	-0.37	-3.70	IC

Summary Statistics

	Sample M31		Sample M32	
Grand Means	17.79	Percent	17.72	Percent
Std Dev Btwn Labs	0.09	Percent	0.10	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 56 of 63 reporting participants

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 187
Chemical Analysis Element #8 - Corrosion Resistant Steel - Percent
CHROMIUM (Cr)

Comments on assigned Data Flags for Analysis #187

<u>WebCode</u>	<u>Flag</u>	<u>Analyst Comment</u>
4FXEUY	X	Data for sample M31 are low. Inconsistent in testing between samples.
9FHNTG	X	Inconsistent in testing between samples. Inconsistent within the determinations of sample M32.
JE8NZ6	X	Data for both samples are low. Possible Systematic error. Inconsistent within the determinations of sample M32.
LXDNAG	X	Data for sample M31 are high. Inconsistent in testing between samples. Inconsistent within the determinations of sample M31.
QQJCZV	X	Data for sample M31 are low. Inconsistent in testing between samples.
U97YXF	X	Data for sample M31 are high. Inconsistent in testing between samples.
X9HM4Z	X	Data for sample M32 are low. Inconsistent in testing between samples. Inconsistent within the determinations of sample M32.

Cycle 112
4th Q, 2015

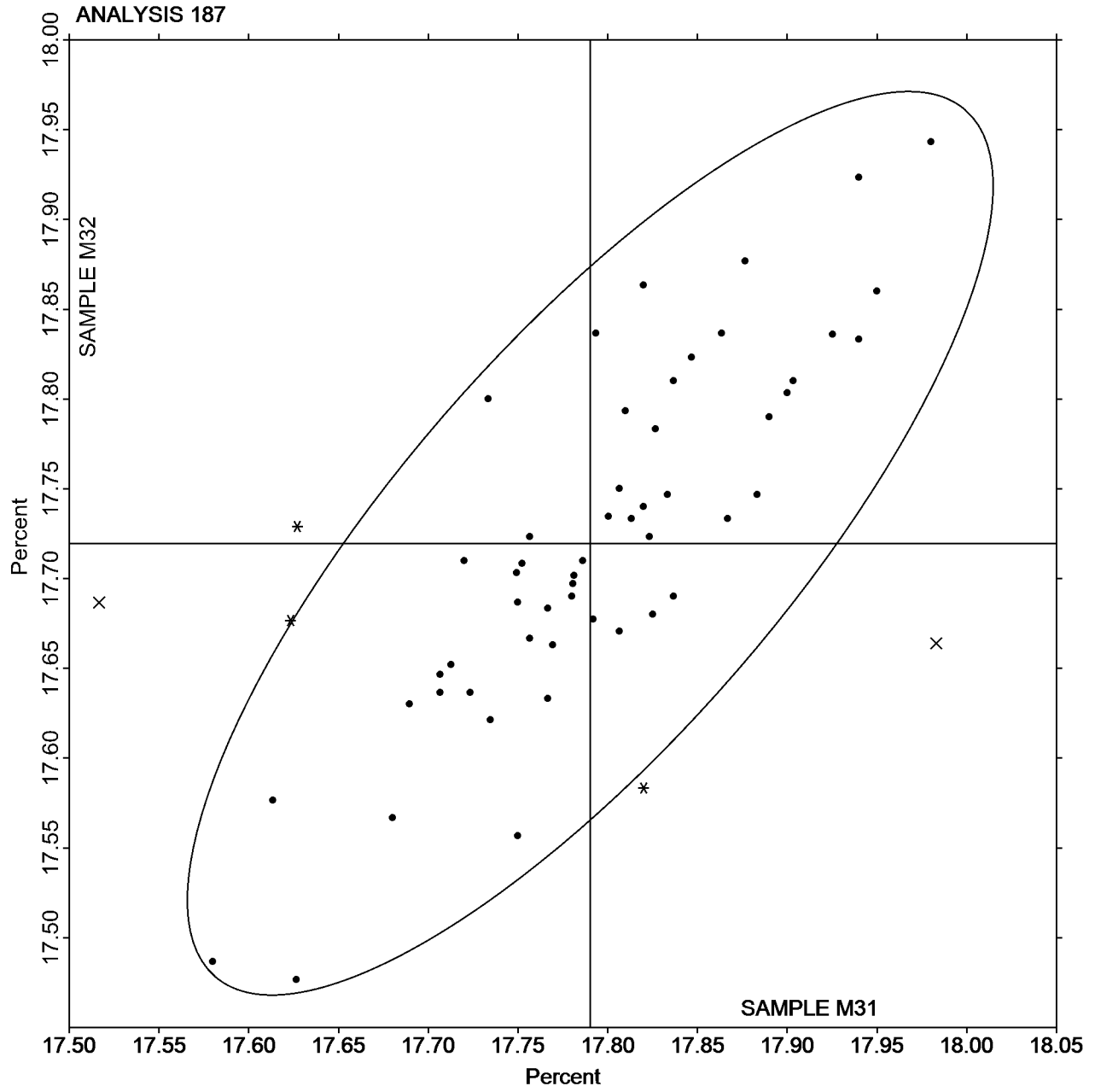
Interlaboratory Testing Program for Metals

Analysis 187

Chemical Analysis Element #8 - Corrosion Resistant Steel - Percent
CHROMIUM (Cr)

SAMPLE M31
17.79 Percent

SAMPLE M32
17.72 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 188

Chemical Analysis Element #9 - Corrosion Resistant Steel - Percent
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.1234	-0.0100	-1.15	0.3842	0.0001	0.01	IC
33UTRA		0.1286	-0.0049	-0.56	0.3840	-0.0001	-0.01	WD
3H4G3P		0.1473	0.0139	1.61	0.3683	-0.0158	-1.38	OE
4B636U		0.1343	0.0009	0.11	0.3837	-0.0004	-0.04	IC
4ENAGB		0.1297	-0.0037	-0.43	0.3847	0.0006	0.05	WD
4FH33L		0.1293	-0.0041	-0.47	0.3567	-0.0274	-2.41	OE
4FXEUY		0.1180	-0.0154	-1.78	0.3913	0.0072	0.64	WD
4RBLHC		0.1303	-0.0031	-0.35	0.3860	0.0019	0.17	OE
7QM6C9		0.1373	0.0039	0.45	0.4017	0.0176	1.54	GD
7U8WPW		0.1173	-0.0161	-1.85	0.3670	-0.0171	-1.50	OE
8BQC4D	X	0.1643	0.0309	3.57	0.3740	-0.0101	-0.88	OE
92HXX6		0.1310	-0.0024	-0.28	0.3787	-0.0054	-0.48	OE
9FHNTG	*	0.1603	0.0269	3.10	0.3927	0.0086	0.75	OE
9FHNV3		0.1353	0.0019	0.22	0.3777	-0.0064	-0.56	IC
A3UWRD		0.1237	-0.0097	-1.12	0.3797	-0.0044	-0.39	WD
AFJTVW		0.1440	0.0106	1.22	0.3760	-0.0081	-0.71	OE
AQEZQG		0.1250	-0.0084	-0.97	0.4050	0.0209	1.84	OE
BEHMLG		0.1360	0.0026	0.30	0.3883	0.0042	0.37	IC
CBV64V		0.1253	-0.0081	-0.93	0.3757	-0.0084	-0.74	WD
CVN2NW		0.1503	0.0169	1.95	0.3730	-0.0111	-0.97	OE
DAVP2H		0.1403	0.0069	0.80	0.4037	0.0196	1.72	GD
DNEANX		0.1373	0.0039	0.45	0.3793	-0.0048	-0.42	OE
DQ694G		0.1447	0.0113	1.30	0.3903	0.0062	0.55	XX
DVH8HV		0.1310	-0.0024	-0.27	0.3792	-0.0049	-0.43	OE
EUYU6H		0.1357	0.0023	0.26	0.3880	0.0039	0.34	OE
EYCN8U		0.1293	-0.0041	-0.47	0.3860	0.0019	0.17	WD
F2Z9PJ	X	0.0997	-0.0337	-3.89	0.3357	-0.0484	-4.25	OE
FMFW42		0.1320	-0.0014	-0.16	0.3790	-0.0051	-0.45	WD
FPKEEQ		0.1370	0.0036	0.41	0.3793	-0.0048	-0.42	OE
GA4QPT		0.1250	-0.0084	-0.97	0.3850	0.0009	0.08	OE
GEYKMU		0.1300	-0.0034	-0.39	0.3873	0.0032	0.28	DR
GFAA2Z	X	0.1277	-0.0057	-0.66	0.3423	-0.0418	-3.66	OE
GTLQXX		0.1300	-0.0034	-0.39	0.3817	-0.0024	-0.21	XR
H6PHTG		0.1273	-0.0061	-0.70	0.3737	-0.0104	-0.91	OE
J8TMT9		0.1443	0.0109	1.26	0.3997	0.0156	1.37	OE
JCNGPN		0.1264	-0.0070	-0.81	0.3800	-0.0041	-0.36	OE
JE8NZ6	X	0.1900	0.0566	6.53	0.3067	-0.0774	-6.79	ED
JK34ZD		0.1330	-0.0004	-0.05	0.3827	-0.0014	-0.12	OE
L93EYU		0.1167	-0.0167	-1.93	0.3717	-0.0124	-1.09	OE
LARLEK		0.1323	-0.0011	-0.12	0.3813	-0.0028	-0.24	ED
LTN7XQ		0.1250	-0.0084	-0.97	0.3743	-0.0098	-0.86	OE
LXDNAG		0.1300	-0.0034	-0.39	0.3733	-0.0108	-0.94	OE
MFGK97		0.1300	-0.0034	-0.39	0.3777	-0.0064	-0.56	OE
MK8UH6		0.1457	0.0123	1.41	0.4043	0.0202	1.78	OE
NN2B94		0.1380	0.0046	0.53	0.3793	-0.0048	-0.42	OE
PNZME7		0.1390	0.0056	0.64	0.4110	0.0269	2.36	OE
QE64D4		0.1353	0.0019	0.22	0.3703	-0.0138	-1.21	OE
QQJC2G	*	0.1340	0.0006	0.07	0.4170	0.0329	2.89	GD
QQJCZV	X	0.3957	0.2623	30.24	0.1393	-0.2448	-21.48	DR

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 188

Chemical Analysis Element #9 - Corrosion Resistant Steel - Percent
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
QUJCD8	X	0.1253	-0.0081	-0.93	0.3257	-0.0584	-5.13	OE
QZAX8E		0.1330	-0.0004	-0.05	0.3810	-0.0031	-0.27	OE
RWP8JV		0.1313	-0.0021	-0.24	0.3790	-0.0051	-0.45	OE
TFU3UY		0.1490	0.0156	1.80	0.3820	-0.0021	-0.18	OE
TMQ8D2		0.1309	-0.0025	-0.29	0.3857	0.0016	0.14	ED
TV9F2X		0.1270	-0.0064	-0.74	0.3797	-0.0044	-0.39	WD
U97YXF		0.1520	0.0186	2.14	0.3840	-0.0001	-0.01	OE
VDGAQA		0.1347	0.0013	0.14	0.3867	0.0026	0.23	OE
VGGKLA		0.1373	0.0039	0.45	0.4027	0.0186	1.63	OE
WDWVXQ		0.1287	-0.0047	-0.55	0.3810	-0.0031	-0.27	WD
WZ7YYE		0.1333	-0.0001	-0.01	0.3900	0.0059	0.52	ED
WZBJLG		0.1343	0.0009	0.11	0.3977	0.0136	1.19	XX
X9HM4Z		0.1233	-0.0101	-1.16	0.3700	-0.0141	-1.24	AA

Summary Statistics

	Sample M31		Sample M32	
Grand Means	0.1334	Percent	0.3841	Percent
Std Dev Btwn Labs	0.0087	Percent	0.0114	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 56 of 62 reporting participants

Comments on assigned Data Flags for Analysis #188

WebCode Flag Analyst Comment

8BQC4D X Data for sample M31 are high.

F2Z9PJ X Data for both samples are low.

GFAA2Z X Data for sample M32 are low.

JE8NZ6 X Data for sample M31 are high and data for sample M32 are low. Inconsistent within the determinations of both samples.

QQJCZV X Extreme Data.

QUJCD8 X Data for sample M32 are low.

Cycle 112
4th Q, 2015

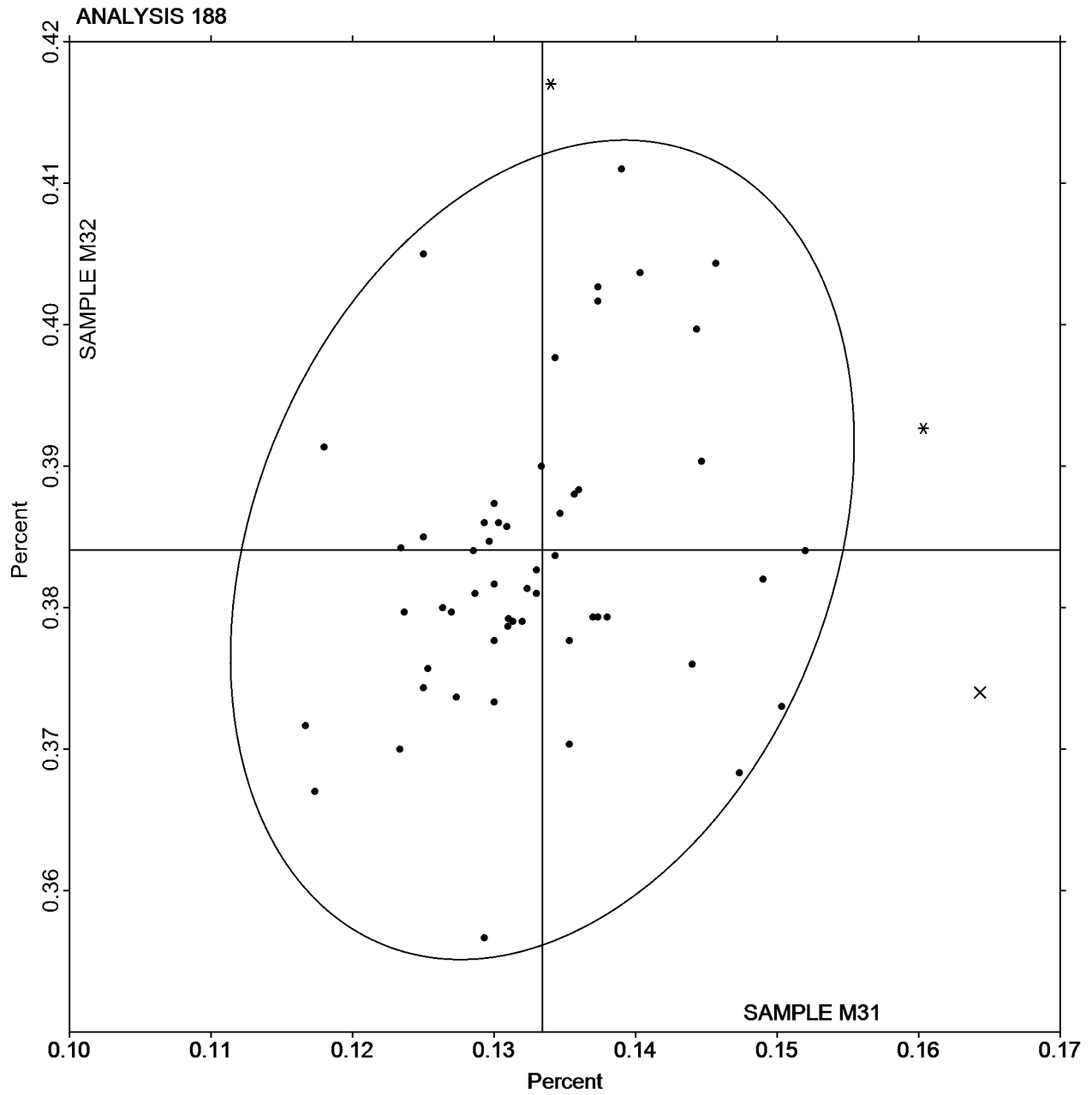
Interlaboratory Testing Program for Metals

Analysis 188

Chemical Analysis Element #9 - Corrosion Resistant Steel - Percent
MOLYBDENUM (Mo)

SAMPLE M31
0.1334 Percent

SAMPLE M32
0.3841 Percent



Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 189

Chemical Analysis Element #10 - Corrosion Resistant Steel - Percent
VANADIUM (V)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
2RZXEN		0.0492	-0.0016	-0.29	0.0815	0.0007	0.17	IC
33UTRA		0.0550	0.0042	0.78	0.0860	0.0053	1.20	OE
3H4G3P		0.0547	0.0039	0.71	0.0810	0.0003	0.06	OE
4B636U		0.0507	-0.0001	-0.02	0.0860	0.0053	1.20	IC
4ENAGB		0.0448	-0.0060	-1.10	0.0774	-0.0034	-0.76	WD
4FXEUY		0.0458	-0.0049	-0.91	0.0773	-0.0034	-0.77	WD
4RBLHC		0.0530	0.0022	0.41	0.0820	0.0013	0.29	OE
7QM6C9		0.0397	-0.0111	-2.04	0.0730	-0.0077	-1.76	GD
7U8WPW		0.0475	-0.0033	-0.60	0.0800	-0.0007	-0.17	OE
8BQC4D		0.0540	0.0032	0.59	0.0810	0.0003	0.06	OE
92HXX6		0.0520	0.0012	0.22	0.0840	0.0033	0.74	OE
9FHNTG	X	0.0293	-0.0214	-3.94	0.0600	-0.0207	-4.71	OE
9FHNV3		0.0557	0.0049	0.90	0.0857	0.0049	1.12	IC
A3UWRD		0.0430	-0.0078	-1.43	0.0770	-0.0037	-0.85	WD
AFJTVW		0.0573	0.0066	1.20	0.0812	0.0005	0.11	OE
AQEZQG		0.0590	0.0082	1.51	0.0883	0.0076	1.73	OE
BEHMLG		0.0477	-0.0030	-0.56	0.0787	-0.0021	-0.47	IC
CBV64V		0.0467	-0.0041	-0.76	0.0800	-0.0007	-0.17	WD
CVN2NW	*	0.0359	-0.0149	-2.74	0.0680	-0.0127	-2.89	OE
DAVP2H		0.0470	-0.0038	-0.69	0.0783	-0.0024	-0.54	XX
DNEANX		0.0550	0.0042	0.78	0.0823	0.0016	0.36	OE
DQ694G		0.0477	-0.0031	-0.57	0.0800	-0.0007	-0.17	XX
DVH8HV		0.0476	-0.0032	-0.58	0.0764	-0.0043	-0.98	OE
EUYU6H		0.0521	0.0014	0.25	0.0837	0.0030	0.68	OE
EYCN8U		0.0530	0.0022	0.41	0.0770	-0.0037	-0.85	OE
F2Z9PJ		0.0607	0.0099	1.82	0.0843	0.0036	0.82	OE
FMFW42		0.0518	0.0010	0.18	0.0840	0.0033	0.74	WD
FPKEEQ		0.0477	-0.0031	-0.57	0.0860	0.0053	1.20	OE
GA4QPT		0.0490	-0.0018	-0.33	0.0750	-0.0057	-1.30	OE
GEYKMU		0.0530	0.0022	0.41	0.0810	0.0003	0.06	DR
GFAA2Z		0.0547	0.0039	0.71	0.0837	0.0029	0.67	OE
GTLQXX		0.0480	-0.0028	-0.51	0.0790	-0.0017	-0.39	XR
H6PHTG		0.0537	0.0029	0.53	0.0887	0.0079	1.80	OE
J8TMT9		0.0580	0.0072	1.33	0.0797	-0.0011	-0.24	OE
JE8NZ6		0.0467	-0.0041	-0.76	0.0767	-0.0041	-0.92	ED
JK34ZD		0.0500	-0.0008	-0.14	0.0757	-0.0051	-1.15	OE
L93EYU		0.0467	-0.0041	-0.76	0.0767	-0.0041	-0.92	OE
LTN7XQ	*	0.0657	0.0149	2.74	0.0940	0.0133	3.01	OE
LXDNAG		0.0500	-0.0008	-0.14	0.0800	-0.0007	-0.17	OE
MFGK97		0.0543	0.0036	0.65	0.0833	0.0026	0.59	OE
MK8UH6		0.0550	0.0042	0.78	0.0817	0.0009	0.21	OE
NN2B94	*	0.0440	-0.0068	-1.25	0.0843	0.0036	0.82	OE
PNZME7		0.0492	-0.0016	-0.30	0.0791	-0.0016	-0.36	XX
QE64D4		0.0540	0.0032	0.59	0.0750	-0.0057	-1.30	OE
QQJC2G		0.0470	-0.0038	-0.69	0.0813	0.0006	0.14	GD
QUJCD8		0.0537	0.0029	0.53	0.0840	0.0033	0.74	OE
QZAX8E		0.0402	-0.0106	-1.95	0.0800	-0.0008	-0.17	OE
TFU3UY		0.0583	0.0076	1.39	0.0823	0.0016	0.36	OE
TV9F2X		0.0530	0.0022	0.41	0.0850	0.0043	0.97	OE

Cycle 112
4th Q, 2015

Interlaboratory Testing Program for Metals
Analysis 189

Chemical Analysis Element #10 - Corrosion Resistant Steel - Percent
VANADIUM (V)

WebCode	Data Flag	Sample M31			Sample M32			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
U97YXF		0.0448	-0.0059	-1.09	0.0770	-0.0037	-0.85	OE
VDGAQA		0.0550	0.0042	0.78	0.0780	-0.0027	-0.62	OE
VGGKLA		0.0507	-0.0001	-0.02	0.0770	-0.0037	-0.85	OE
WDWVXQ		0.0547	0.0039	0.71	0.0833	0.0026	0.59	WD
WZ7YYE	X	0.0900	0.0392	7.21	0.0733	-0.0074	-1.68	ED
WZBJLG		0.0510	0.0002	0.04	0.0827	0.0019	0.44	XX
X9HM4Z		0.0477	-0.0031	-0.57	0.0750	-0.0057	-1.30	AA

Summary Statistics				
	Sample M31		Sample M32	
Grand Means	0.0508	Percent	0.0807	Percent
Std Dev Btwn Labs	0.0054	Percent	0.0044	Percent

Samples M31 , M32 : AISI 321, two different heats

Statistics based on 54 of 56 reporting participants

Comments on assigned Data Flags for Analysis #189

WebCode Flag Analyst Comment

9FHNTG X Data for both samples are low.

WZ7YYE X Data for sample M31 are high. Inconsistent within the determinations of sample M31.

Cycle 112
4th Q, 2015

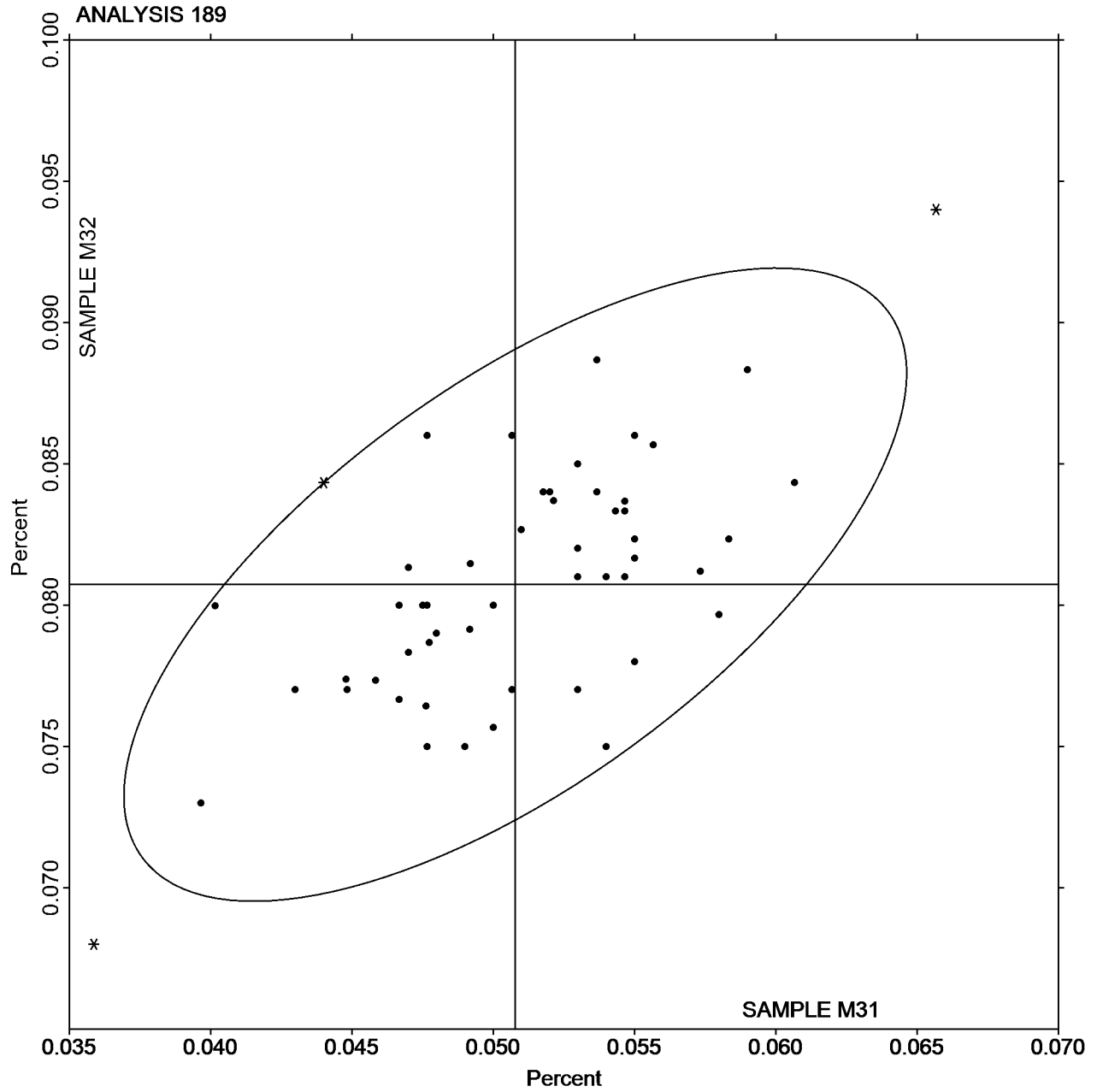
Interlaboratory Testing Program for Metals

Analysis 189

Chemical Analysis Element #10 - Corrosion Resistant Steel - Percent
VANADIUM (V)

SAMPLE M31
0.0508 Percent

SAMPLE M32
0.0807 Percent



Instrument and Method Code List - Cycle 112

Instrument and Method information as provided by laboratories

Instruments are no longer tracked for analyses 105-148

160: Copper-based Alloy, Element #1 - COPPER (Cu)

<u>Instrument code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
BD	By Difference
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
EL	Electrochemistry
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

161: Copper-based Alloy, Element #2 - ALUMINUM (Al)

<u>Instrument code</u>	<u>Description</u>
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

162: Copper-based Alloy, Element #3 - IRON (Fe)

<u>Instrument code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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

163: Copper-based Alloy, Element #4 - MANGANESE (Mn)

<u>Instrument code</u>	<u>Description</u>
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

164: Copper-based Alloy, Element #5 - NICKEL (Ni)

<u>Instrument code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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

165: Copper-based Alloy, Element #6 - TIN (Sn)

<u>Instrument code</u>	<u>Description</u>
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

166: Copper-based Alloy, Element #7 - SILICON (Si)

<u>Instrument code</u>	<u>Description</u>
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

167: Copper-based Alloy, Element #8 - ZINC (Zn)

<u>Instrument code</u>	<u>Description</u>
GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

180: Corrosion Resistant Steel, Element #1 - CARBON (C)

<u>Method Code</u>	<u>Description</u>
CI	Combustion / IR
CO	Combustion
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
GD	Spectrometry - Glow Discharge (GDS)
IR	IR (Absorbstion / Detection)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

181: Corrosion Resistant Steel, Element #2 - MANGANESE (Mn)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

182: Corrosion Resistant Steel, Element #3 - PHOSPHORUS (P)

<u>Method Code</u>	<u>Description</u>
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)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

183: Corrosion Resistant Steel, Element #4 - TITANIUM (Ti)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

184: Corrosion Resistant Steel, Element #5 - SILICON (Si)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

185: Corrosion Resistant Steel, Element #6 - NITROGEN (N)

<u>Method Code</u>	<u>Description</u>
CI	Combustion / IR
CO	Combustion
ED	X-Ray Fluorescence - Energy Dispersive (EDX)
IR	IR (Absorbstion / Detection)
OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element

186: Corrosion Resistant Steel, Element #7 - NICKEL (Ni)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
WC	Wet Chemistry
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

187: Corrosion Resistant Steel, Element #8 - CHROMIUM (Cr)

<u>Method Code</u>	<u>Description</u>
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)
TI	Titrimetry
WC	Wet Chemistry
WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

188: Corrosion Resistant Steel, Element #9 - MOLYBDENUM (Mo)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
XR	X-Ray Fluorescence - ED or WD not specified
XX	Please Indicate Method Used for Current Element

189: Corrosion Resistant Steel, Element #10 - VANADIUM (V)

<u>Method Code</u>	<u>Description</u>
AA	Spectrometry - Atomic Absorption (AAS)
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)
XR	X-Ray Fluorescence - ED or WD not specified
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	CAUTION - 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	STOP - 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	PROCEED - 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.