

Fasteners & Metals Interlaboratory Testing Program

Summary Report Cycle 128, 4th Qtr 2019

[About the Metals Program](#) [About CTS](#) [Key to Tables and Graphs](#)

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

Impact Tests	
---------------------	--

104	Charpy V-Notch (Room Temperature)
---------------------	---

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

130	Tensile Strength: Lab-Machined Flat Steel
---------------------	---

131	Yield Strength: Lab-Machined Flat Steel
---------------------	---

132	Elongation: Lab-Machined Flat Steel
---------------------	---

133	r-Value: Lab-Machined Flat Steel
---------------------	--

134	n-Value: Lab-Machined Flat Steel
---------------------	--

Fasteners	
------------------	--

115	Fastener Wedge Tensile (10 degree)
---------------------	--

116	Fastener Axial Tensile
---------------------	--

125	Rockwell Hardness: Externally Threaded Fasteners
---------------------	--

126	Vickers Hardness: Externally Threaded Fasteners
---------------------	---

127	Fastener Wedge Tensile (10 degree) - 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

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.



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 104

Charpy V-Notch (Room Temperature)
ASTM E23

WebCode	Data Flag	Sample U63			Sample U64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
FED7BA		45.52	-1.23	-0.34	49.86	6.39	1.69
JRWWVN		43.33	-3.42	-0.95	40.00	-3.47	-0.92
PXKLRT		49.93	3.18	0.88	45.63	2.16	0.57
QLTLD3		44.00	-2.75	-0.76	43.33	-0.14	-0.04
R6RZNE		45.33	-1.42	-0.39	40.00	-3.47	-0.92
RQ6UBQ		52.40	5.65	1.57	42.00	-1.47	-0.39

Summary Statistics

	Sample U63		Sample U64	
Grand Means	46.75	Joule	43.47	Joule
Stnd Dev Btwn Labs	3.60	Joule	3.79	Joule

Samples U63, U64 : AISI 4340, AISI 4340

Statistics based on 6 of 6 reporting participants



Analysis 104

Charpy V-Notch (Room Temperature)

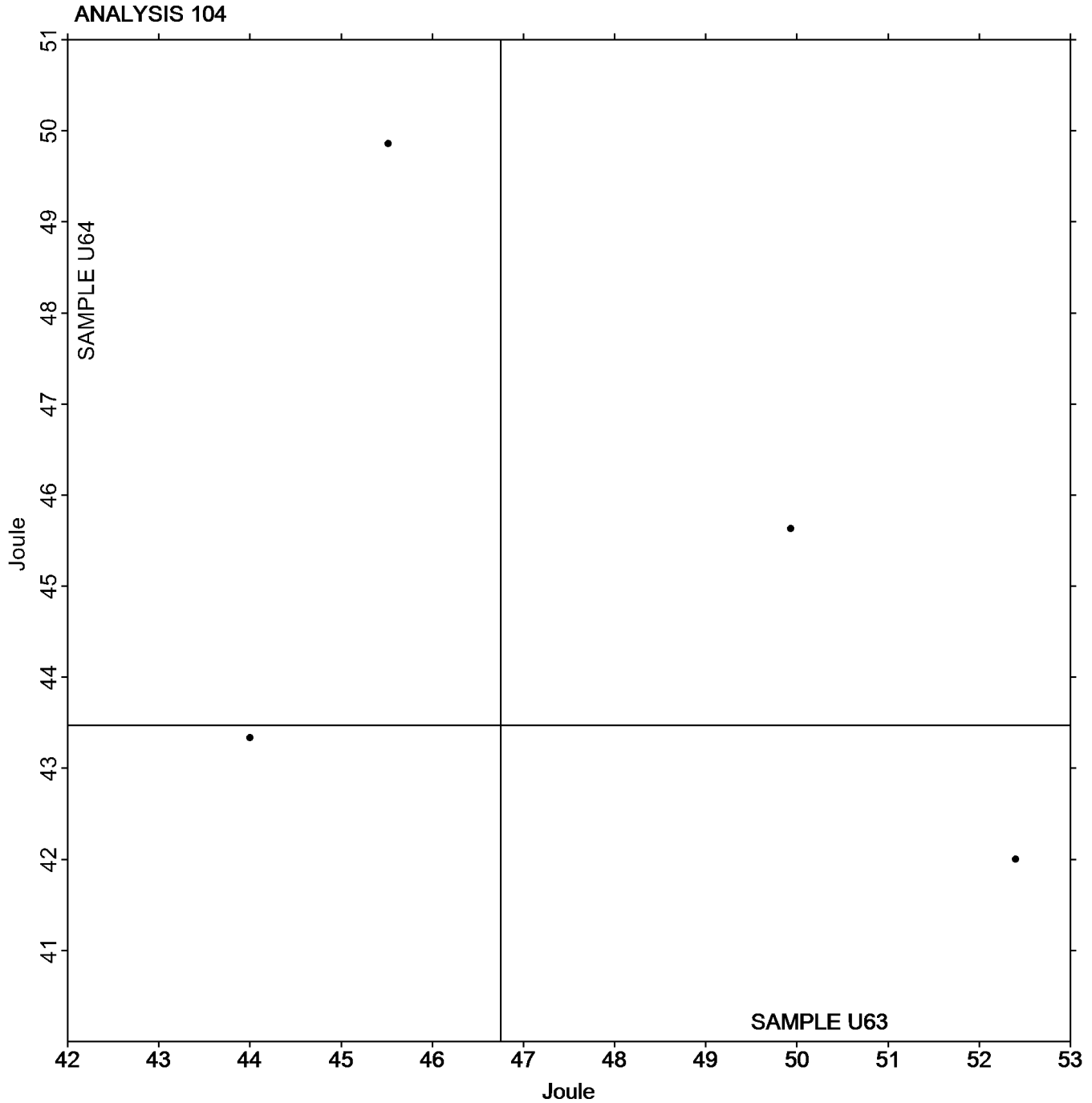
ASTM E23

SAMPLE U63

SAMPLE U64

46.75 Joule

43.47 Joule





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 115

Fastener Wedge Tensile (10 degree)
ASTM F606

WebCode	Data Flag	Sample X63			Sample X64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
2JELT7	X	168.55	23.80	21.85	168.39	23.47	23.73
33JQJC	*	142.33	-2.41	-2.21	142.40	-2.53	-2.55
3HHJHZ		145.25	0.50	0.46	145.36	0.44	0.44
3R4RXG		144.90	0.16	0.14	145.49	0.57	0.57
49CWAZ		144.49	-0.26	-0.24	143.59	-1.34	-1.35
4XN9UY		144.27	-0.48	-0.44	144.36	-0.56	-0.57
6BVFJW		143.79	-0.96	-0.88	143.93	-1.00	-1.01
87B892	X	11.06	-133.68	-122.71	11.03	-133.89	-135.40
8CEDM6	X	150.67	5.92	5.43	152.33	7.41	7.49
8TLKR9		145.25	0.51	0.47	145.45	0.52	0.53
8XJPXZ		144.41	-0.33	-0.30	144.68	-0.24	-0.24
9JGMRC		145.43	0.69	0.63	145.73	0.81	0.82
CKYVD9		143.99	-0.75	-0.69	144.17	-0.76	-0.77
CPBQCR	X	12.14	-132.60	-121.71	12.24	-132.68	-134.18
CX8LDV		146.02	1.28	1.17	145.38	0.45	0.46
D2XHCL		146.27	1.52	1.40	145.20	0.27	0.28
D9HMZF		143.73	-1.01	-0.93	145.10	0.18	0.18
DHXQUR	*	147.73	2.99	2.74	147.63	2.71	2.74
DVW4NY		144.27	-0.48	-0.44	144.67	-0.26	-0.26
E3AJRT	X	282.34	137.60	126.30	146.97	2.05	2.07
E6X79M		144.83	0.09	0.08	144.73	-0.19	-0.19
EPH4QX		146.67	1.92	1.76	145.67	0.74	0.75
F34GLK		143.87	-0.88	-0.81	145.43	0.51	0.51
FED7BA		146.77	2.02	1.85	146.92	1.99	2.02
FHKD2G		146.43	1.69	1.55	147.20	2.27	2.30
G2Q89E		145.93	1.19	1.09	145.93	1.01	1.02
GV2M7J		144.27	-0.48	-0.44	144.07	-0.86	-0.87
GY3V8M		144.30	-0.45	-0.41	144.20	-0.73	-0.73
H924AQ		143.74	-1.01	-0.92	144.22	-0.71	-0.72
H9U8GD		145.72	0.97	0.89	144.93	0.00	0.00
JRWWVN		144.63	-0.12	-0.11	145.28	0.36	0.36
KJFRDN		144.47	-0.27	-0.25	144.56	-0.37	-0.37
KZK4Z8		143.33	-1.41	-1.30	143.67	-1.26	-1.27
L734JG	X	14.45	-130.30	-119.60	14.50	-130.43	-131.89
L77DPV		144.00	-0.75	-0.68	144.67	-0.26	-0.26
LEFZHW		144.99	0.24	0.22	144.77	-0.15	-0.15
MYZ4UM		145.01	0.27	0.25	144.84	-0.09	-0.09
NET9LG		144.09	-0.66	-0.61	143.66	-1.27	-1.28
NGYP3K		144.80	0.05	0.05	144.33	-0.59	-0.60
PCGNGD		144.17	-0.58	-0.53	144.20	-0.73	-0.73
PW6HYM		145.53	0.79	0.72	145.37	0.44	0.45
PYCJYZ		147.14	2.40	2.20	146.86	1.94	1.96
QFBEPW		144.57	-0.18	-0.16	144.57	-0.36	-0.36
QXF4Z		144.09	-0.66	-0.61	144.95	0.02	0.02
QK9LLR	X	142.00	-2.75	-2.52	144.33	-0.59	-0.60
QQXYMF		145.00	0.25	0.23	144.78	-0.15	-0.15
QRQYH6		142.04	-2.71	-2.49	142.64	-2.28	-2.31



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 115

Fastener Wedge Tensile (10 degree)
ASTM F606

WebCode	Data Flag	Sample X63			Sample X64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
R69B6Y		145.13	0.39	0.36	145.20	0.27	0.28
RJVGG3		144.92	0.18	0.16	146.12	1.19	1.21
RQ6UBQ		145.07	0.32	0.30	144.89	-0.04	-0.04
TZVQXD		144.13	-0.61	-0.56	145.30	0.37	0.38
URBAH9		143.50	-1.25	-1.14	144.10	-0.83	-0.83
WXWQ6J		144.27	-0.48	-0.44	144.27	-0.66	-0.67
X4HYAA		144.95	0.20	0.18	145.38	0.45	0.46
X7WUEK		145.10	0.35	0.33	145.33	0.41	0.41
YJR3AU		143.35	-1.39	-1.28	144.23	-0.70	-0.71
YK GK4F		144.27	-0.48	-0.44	145.62	0.69	0.70
YLYDB6	X	11.22	-133.53	-122.56	11.19	-133.73	-135.24
Z7FA2E		145.37	0.62	0.57	145.30	0.37	0.38
ZGZLFD		145.03	0.28	0.26	145.52	0.59	0.60
ZMYBDH		143.93	-0.81	-0.75	144.23	-0.70	-0.70

Summary Statistics

	Sample X63		Sample X64	
Grand Means	144.75	ksi	144.93	ksi
Std Dev Btwn Labs	1.09	ksi	0.99	ksi

Samples X63, X64 : 3/8-16 x 2 1/4, 3/8-16 x 2 1/4

Statistics based on 53 of 61 reporting participants

Comments on Assigned Data Flags for Test #115

- 2JELT7 (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample X64.
- 87B892 (X) - Extreme data.
- 8CEDM6 (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample X63.
- CPBQCR (X) - Extreme data.
- E3AJRT (X) - Extreme data for sample X63.
- L734JG (X) - Extreme data.
- QK9LLR (X) - Inconsistent in testing between samples.
- YLYDB6 (X) - Extreme data.



Analysis 115

Fastener Wedge Tensile (10 degree)

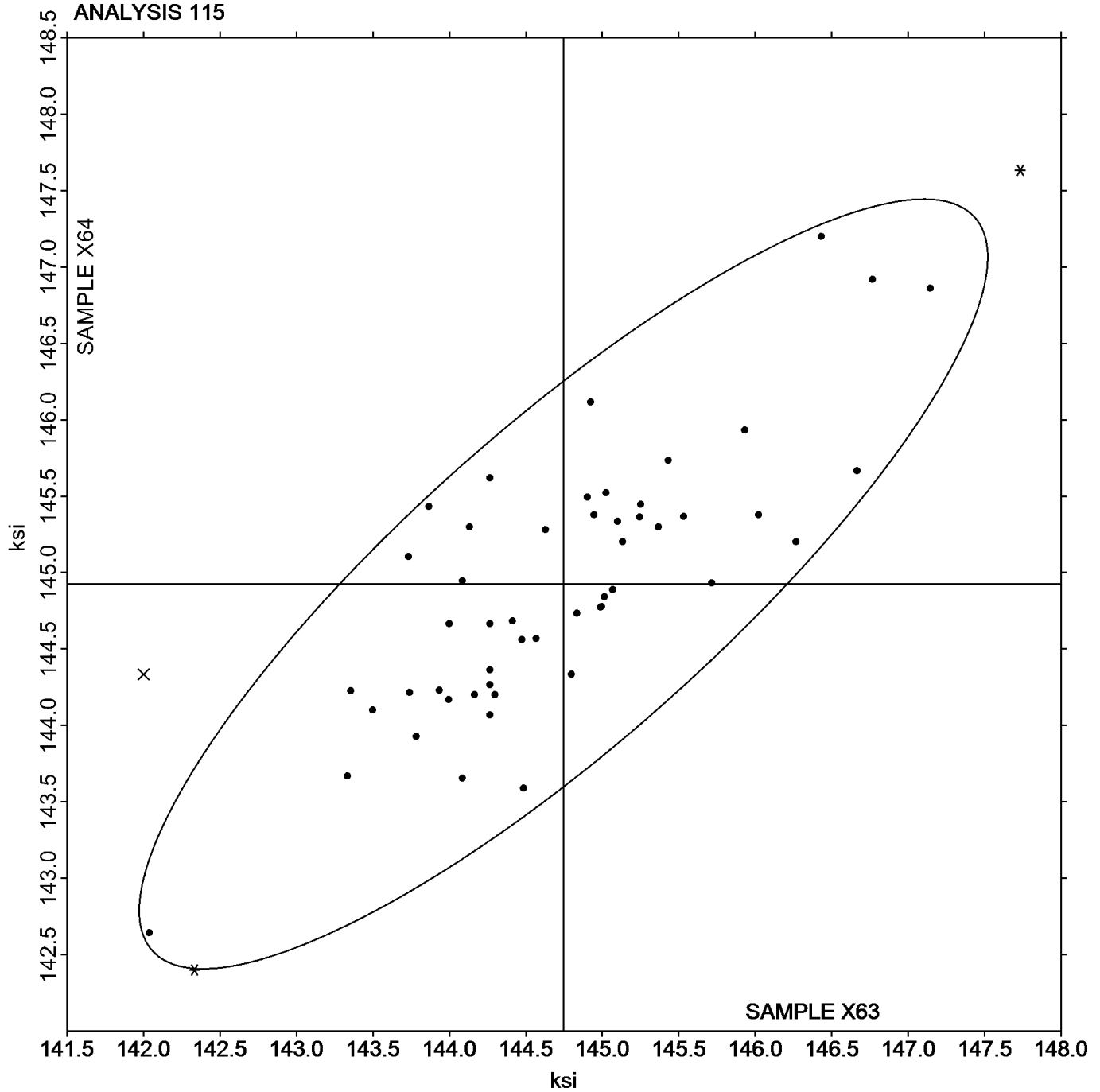
ASTM F606

SAMPLE X63

SAMPLE X64

144.75 ksi

144.93 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 116

Fastener Axial Tensile
ASTM F606

WebCode	Data Flag	Sample Q63			Sample Q64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
2JELT7	X	168.65	23.39	16.63	169.40	24.12	17.75
33JQJC		142.63	-2.63	-1.87	142.80	-2.48	-1.83
33P2FH	*	144.47	-0.79	-0.56	143.07	-2.21	-1.63
3DMPRL	X	153.00	7.74	5.50	153.33	8.05	5.92
3HHJHZ		145.77	0.50	0.36	145.15	-0.13	-0.10
3R4RXG		146.02	0.76	0.54	146.24	0.95	0.70
46R7QH		145.42	0.16	0.11	145.66	0.37	0.27
4XN9UY		143.69	-1.58	-1.12	144.36	-0.92	-0.68
673EJ3		144.45	-0.82	-0.58	144.88	-0.40	-0.30
6BVFJW		144.52	-0.74	-0.53	144.66	-0.63	-0.46
7HQMUP		147.52	2.26	1.61	148.26	2.98	2.19
7NHW4M		142.51	-2.75	-1.96	142.42	-2.86	-2.11
7VUD93	*	142.50	-2.76	-1.96	143.93	-1.35	-0.99
87B892	X	11.07	-134.19	-95.41	11.06	-134.23	-98.78
8TLKR9		147.63	2.37	1.68	148.40	3.12	2.29
8XJPXZ		145.85	0.59	0.42	144.91	-0.38	-0.28
9JGMRC		145.97	0.70	0.50	145.83	0.55	0.40
9L47TA	X	145.33	0.07	0.05	149.67	4.38	3.23
B8U6BP		144.42	-0.84	-0.60	145.34	0.06	0.04
BEQAVD	*	148.03	2.77	1.97	148.74	3.46	2.55
C668KX		145.03	-0.23	-0.16	144.58	-0.70	-0.51
CEAJCL		144.25	-1.01	-0.72	143.99	-1.30	-0.95
CKYVD9		143.38	-1.89	-1.34	144.25	-1.04	-0.76
CX8LDV		145.16	-0.10	-0.07	146.11	0.82	0.61
D2XHCL		146.23	0.97	0.69	146.57	1.28	0.94
D3WJFR		144.20	-1.06	-0.76	144.87	-0.42	-0.31
DHXQUR		148.30	3.04	2.16	147.50	2.22	1.63
E4HV89		144.41	-0.85	-0.61	143.71	-1.57	-1.16
EJ73A9		147.62	2.36	1.68	147.05	1.77	1.30
F34GLK		145.97	0.70	0.50	146.03	0.75	0.55
F6Q4CM		148.50	3.24	2.30	148.24	2.95	2.17
G2Q89E		146.87	1.60	1.14	146.77	1.48	1.09
GV2M7J		144.27	-1.00	-0.71	144.17	-1.12	-0.82
GY3V8M		145.07	-0.20	-0.14	143.90	-1.38	-1.02
GZRDZ9		147.67	2.40	1.71	147.67	2.38	1.75
H924AQ		145.29	0.03	0.02	144.52	-0.77	-0.56
H9U8GD		145.53	0.26	0.19	145.93	0.65	0.48
HQWM4Y		145.22	-0.04	-0.03	144.90	-0.38	-0.28
J7ACVY		146.00	0.74	0.52	145.67	0.38	0.28
JHP78R		145.55	0.29	0.21	146.12	0.83	0.61
JRWWVN		144.62	-0.64	-0.45	145.54	0.25	0.19
JTJNDK		146.39	1.13	0.80	145.86	0.58	0.43
KD984W		145.56	0.30	0.21	144.55	-0.74	-0.54
KJFRDN		144.43	-0.83	-0.59	145.03	-0.25	-0.18
L734JG	X	14.46	-130.80	-93.00	14.42	-130.86	-96.31
L77DPV		143.40	-1.86	-1.33	143.66	-1.63	-1.20
LD8LDB		145.97	0.70	0.50	145.27	-0.02	-0.01



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 116

Fastener Axial Tensile
ASTM F606

WebCode	Data Flag	Sample Q63			Sample Q64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
LK23EZ		146.56	1.30	0.92	146.73	1.45	1.07
MYZ4UM		145.40	0.14	0.10	145.89	0.61	0.45
NDWVZA		146.30	1.04	0.74	146.00	0.71	0.53
NE7XNT		144.95	-0.32	-0.22	145.38	0.09	0.07
NGYP3K		145.10	-0.16	-0.12	144.73	-0.55	-0.40
P8QE8F		145.10	-0.16	-0.12	145.90	0.62	0.45
PCGNGD		142.83	-2.43	-1.73	143.67	-1.62	-1.19
QFBEPW		145.20	-0.06	-0.04	144.87	-0.42	-0.31
QFXF4Z		144.95	-0.32	-0.22	144.09	-1.20	-0.88
QQXYMF		142.61	-2.65	-1.88	143.22	-2.07	-1.52
QR999K		144.94	-0.32	-0.23	145.33	0.05	0.03
R2TR9B		144.20	-1.06	-0.76	144.20	-1.08	-0.80
R69B6Y		146.27	1.00	0.71	145.83	0.55	0.40
RJVGG3		147.14	1.88	1.34	147.38	2.10	1.54
RQ6UBQ		144.66	-0.60	-0.43	145.28	0.00	0.00
T7Y2LX		146.20	0.94	0.66	146.08	0.80	0.59
T8RQ9Y	X	11.32	-133.95	-95.24	11.19	-134.10	-98.69
UNEL4M		145.07	-0.20	-0.14	145.53	0.25	0.18
URBAH9		142.53	-2.73	-1.94	143.10	-2.18	-1.61
VFXDUW		146.97	1.71	1.22	146.91	1.62	1.19
W3NXNR	X	11.22	-134.04	-95.31	11.23	-134.06	-98.66
W77BBZ		144.95	-0.31	-0.22	144.57	-0.72	-0.53
W8VLY8		146.33	1.07	0.76	146.43	1.15	0.85
W8X6WJ		144.93	-0.33	-0.23	144.23	-1.05	-0.77
W9G9NH		146.13	0.87	0.62	145.33	0.05	0.04
WXWQ6J		143.11	-2.16	-1.53	143.30	-1.98	-1.46
X8H8F6		143.90	-1.36	-0.97	144.20	-1.08	-0.80
XXRL8L	X	144.05	-1.21	-0.86	132.21	-13.07	-9.62
YBCJV2		145.67	0.40	0.29	145.00	-0.28	-0.21
YJR3AU		145.65	0.39	0.28	145.47	0.19	0.14
YTE22Z		144.60	-0.66	-0.47	145.67	0.38	0.28
YY2Z7E		144.00	-1.26	-0.90	144.00	-1.28	-0.94
Z7FA2E	X	152.90	7.64	5.43	152.60	7.32	5.38
ZGZLFD		146.32	1.05	0.75	145.29	0.01	0.00
ZMYBDH		145.28	0.02	0.01	145.00	-0.28	-0.21

Summary Statistics

	Sample Q63		Sample Q64	
Grand Means	145.26	ksi	145.28	ksi
Std Dev Btwn Labs	1.41	ksi	1.36	ksi

Samples Q63, Q64 : 3/8-16 x 2 1/4, 3/8-16 x 2 1/4

Statistics based on 73 of 82 reporting participants



Analysis 116

**Fastener Axial Tensile
ASTM F606**

Comments on Assigned Data Flags for Test #116

- 2JELT7 (X) - Data for both samples are high. Possible Systematic Error.
- 3DMPRL (X) - Data for both samples are high. Possible Systematic Error.
- 87B892 (X) - Extreme data.
- 9L47TA (X) - Data for sample Q64 are high.
- L734JG (X) - Extreme data.
- T8RQ9Y (X) - Extreme data.
- W3NXNR (X) - Extreme data.
- XXRL8L (X) - Data for sample Q64 are low. Inconsistent within the determinations of sample Q64.
- Z7FA2E (X) - Data for both samples are high. Possible Systematic Error.



Analysis 116

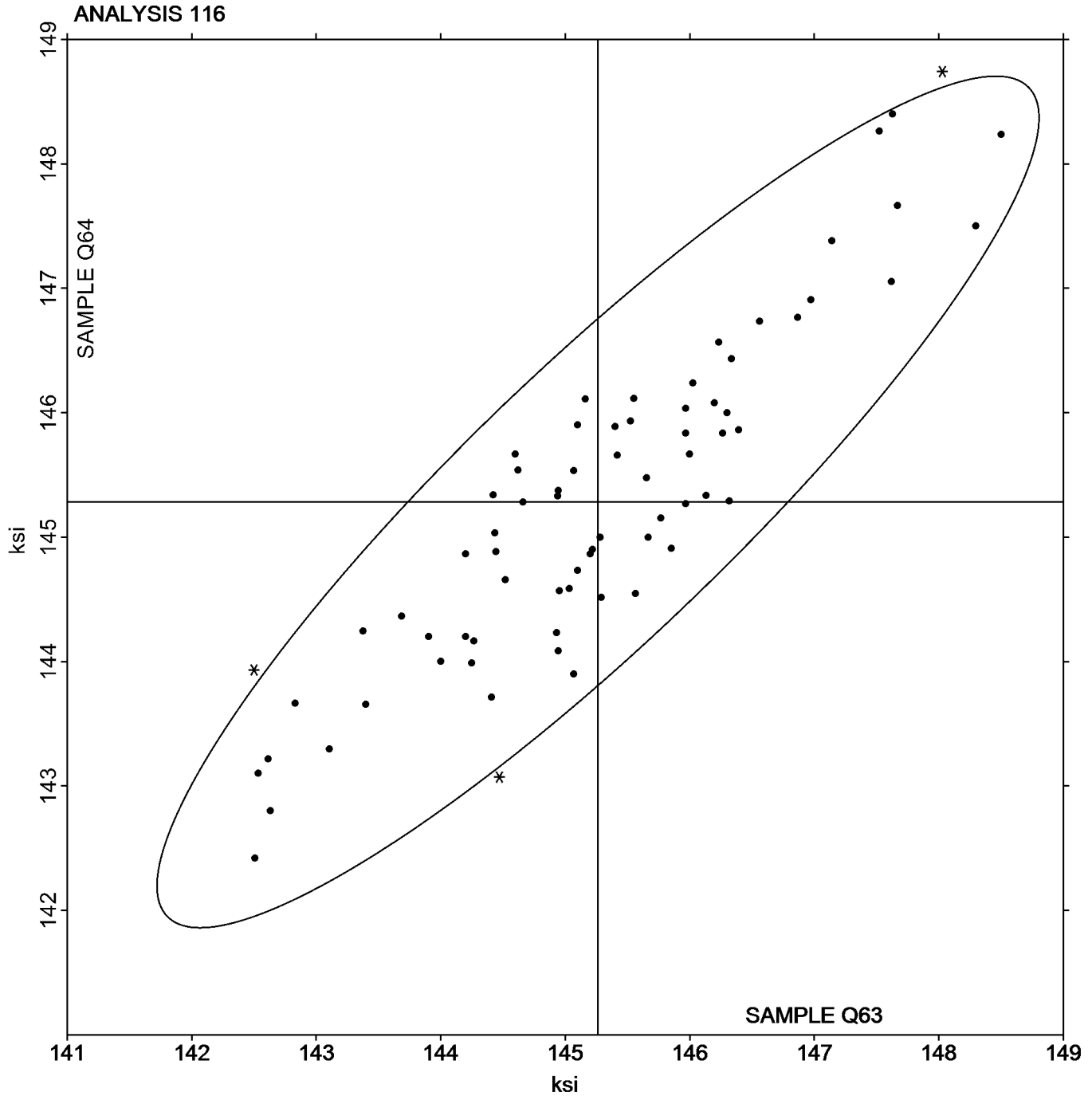
Fastener Axial Tensile
ASTM F606

SAMPLE Q63

SAMPLE Q64

145.26 ksi

145.28 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 120

Rockwell Hardness: C Scale
ASTM E18

WebCode	Data Flag	Sample E63			Sample E64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
32K3WB		61.00	0.00	0.01	56.00	-0.40	-0.89
3HE6RT		60.80	-0.20	-0.48	55.90	-0.50	-1.11
3HHJHZ		60.64	-0.36	-0.86	56.02	-0.38	-0.85
3K648C		61.08	0.08	0.20	56.50	0.10	0.22
3PEKGZ		61.02	0.02	0.05	56.46	0.06	0.13
46A8GQ		61.44	0.44	1.07	56.62	0.22	0.49
4Q7QMJ		61.96	0.96	2.33	56.98	0.58	1.29
6NJMEC		60.93	-0.07	-0.16	56.15	-0.25	-0.56
6YHBG8		60.50	-0.50	-1.20	55.70	-0.70	-1.56
72KDXV		60.82	-0.18	-0.43	56.32	-0.08	-0.18
8LQ99Y		61.24	0.24	0.59	56.62	0.22	0.49
8MJ7DY		60.44	-0.56	-1.35	56.00	-0.40	-0.89
8YDM2Z		61.34	0.34	0.83	56.82	0.42	0.94
9BXFUF		60.82	-0.18	-0.43	55.84	-0.56	-1.25
9JGMRC		61.62	0.62	1.51	57.14	0.74	1.65
AV3J6U		60.52	-0.48	-1.15	55.70	-0.70	-1.56
AXDCAU		61.28	0.28	0.68	56.64	0.24	0.54
BEQAVD		60.84	-0.16	-0.38	56.32	-0.08	-0.18
BUUG73		61.22	0.22	0.54	56.48	0.08	0.18
C7FF74		60.94	-0.06	-0.14	56.34	-0.06	-0.13
CERC9P		61.36	0.36	0.88	56.66	0.26	0.58
CJZVA3		60.94	-0.06	-0.14	56.16	-0.24	-0.53
CRDPKY	*	61.14	0.14	0.34	55.64	-0.76	-1.69
CYD4A7		60.68	-0.32	-0.77	56.70	0.30	0.67
D9HMZF		61.60	0.60	1.46	57.06	0.66	1.47
D9V9FJ		61.14	0.14	0.34	56.48	0.08	0.18
DABD7U		61.12	0.12	0.30	56.74	0.34	0.76
DLNKBV		60.78	-0.22	-0.53	56.72	0.32	0.71
DWKP9A	*	61.31	0.31	0.76	55.90	-0.50	-1.11
E6X79M		61.38	0.38	0.92	56.88	0.48	1.07
FHQ4QJ		61.08	0.08	0.20	56.52	0.12	0.27
FMCRGB		61.74	0.74	1.80	56.98	0.58	1.29
FPFDHV		61.18	0.18	0.44	56.50	0.10	0.22
FTCBFZ		60.54	-0.46	-1.11	56.42	0.02	0.05
G3J6EY		60.66	-0.34	-0.82	56.14	-0.26	-0.58
G8ATVQ		61.18	0.18	0.44	56.52	0.12	0.27
GBWCWN		61.58	0.58	1.41	56.84	0.44	0.98
H6FDTU		61.10	0.10	0.25	56.48	0.08	0.18
HXDFVP		60.78	-0.22	-0.53	56.34	-0.06	-0.13
JHP78R		61.46	0.46	1.12	56.66	0.26	0.58
JRWWVN		60.60	-0.40	-0.96	55.78	-0.62	-1.38
JYQ7W7		60.84	-0.16	-0.38	56.52	0.12	0.27
KMFV9G		60.88	-0.12	-0.28	56.36	-0.04	-0.09
KZK4Z8		61.46	0.46	1.12	57.12	0.72	1.60
L77DPV		60.90	-0.10	-0.24	56.98	0.58	1.29
LBXQEQ		60.82	-0.18	-0.43	56.46	0.06	0.13
LD8LDB		61.34	0.34	0.83	56.60	0.20	0.45



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 120

Rockwell Hardness: C Scale
ASTM E18

WebCode	Data Flag	Sample E63			Sample E64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
LHMTUE		61.10	0.10	0.25	56.32	-0.08	-0.18
LV646R		61.72	0.72	1.75	57.08	0.68	1.52
LVMYLT		61.26	0.26	0.63	56.57	0.17	0.37
LY2QHM		60.84	-0.16	-0.38	56.28	-0.12	-0.27
M8WYVR		60.42	-0.58	-1.39	56.39	-0.01	-0.03
N4LREH		61.12	0.12	0.30	56.64	0.24	0.54
NJKKC7		61.26	0.26	0.63	56.64	0.24	0.54
NUJ9E2		61.02	0.02	0.05	56.56	0.16	0.36
NWN27E		61.24	0.24	0.59	56.88	0.48	1.07
NWQGV9		61.00	0.00	0.01	56.00	-0.40	-0.89
Q4KKFN		61.24	0.25	0.60	56.55	0.15	0.34
Q7G8V6		60.78	-0.22	-0.53	56.32	-0.08	-0.18
QFU38Q	*	60.40	-0.60	-1.44	56.58	0.18	0.40
QYT6FG		60.58	-0.42	-1.01	55.52	-0.88	-1.96
R2RT2W		60.98	-0.02	-0.04	56.04	-0.36	-0.80
R66PG7		60.54	-0.46	-1.11	56.20	-0.20	-0.44
R69B6Y		61.40	0.40	0.97	56.50	0.10	0.22
RJVGG3		61.00	0.00	0.01	56.52	0.12	0.27
RMRZM8		60.24	-0.76	-1.83	56.04	-0.36	-0.80
RR7KLF		61.30	0.30	0.73	55.96	-0.44	-0.98
RWZGA7		60.16	-0.84	-2.03	55.70	-0.70	-1.56
T8RQ9Y		61.46	0.46	1.12	56.98	0.58	1.29
TBBVTF		60.20	-0.80	-1.93	56.00	-0.40	-0.89
TDKUYH		61.26	0.26	0.63	56.84	0.44	0.98
TTMKMF		61.38	0.38	0.92	57.26	0.86	1.92
TZVQXD		60.66	-0.34	-0.82	55.52	-0.88	-1.96
UBL6X9		60.76	-0.24	-0.57	56.62	0.22	0.49
V9V6N4		60.66	-0.34	-0.82	56.20	-0.20	-0.44
VNU9W2		61.28	0.28	0.68	56.92	0.52	1.16
VTJP92		61.16	0.16	0.39	56.16	-0.24	-0.53
W3NXNR		60.74	-0.26	-0.62	56.14	-0.26	-0.58
W8VLY8		61.76	0.76	1.84	57.28	0.88	1.96
WBXHQN	X	62.48	1.48	3.58	57.48	1.08	2.41
WEDTPY		60.30	-0.70	-1.69	55.60	-0.80	-1.78
XV2MR3		60.90	-0.10	-0.24	56.34	-0.06	-0.13
YK GK4F		60.90	-0.10	-0.24	56.60	0.20	0.45
YVYE3E		61.28	0.28	0.68	56.72	0.32	0.71
Z6LLJJ	*	60.14	-0.86	-2.07	55.18	-1.22	-2.72
ZV7XJX	*	59.80	-1.20	-2.90	55.60	-0.80	-1.78
ZW9GND		61.64	0.64	1.55	57.04	0.64	1.43
ZYBJA9		60.86	-0.14	-0.33	55.78	-0.62	-1.38



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 120

Rockwell Hardness: C Scale
ASTM E18

Summary Statistics

	<u>Sample E63</u>		<u>Sample E64</u>	
Grand Means	61.00	HRC	56.40	HRC
Std Dev Btwn Labs	0.41	HRC	0.45	HRC

Samples E63, E64 : Steel, Steel

Statistics based on 87 of 88 reporting participants

Comments on Assigned Data Flags for Test #120

WBXHQN (X) - Data for sample E63 are high.



Analysis 120

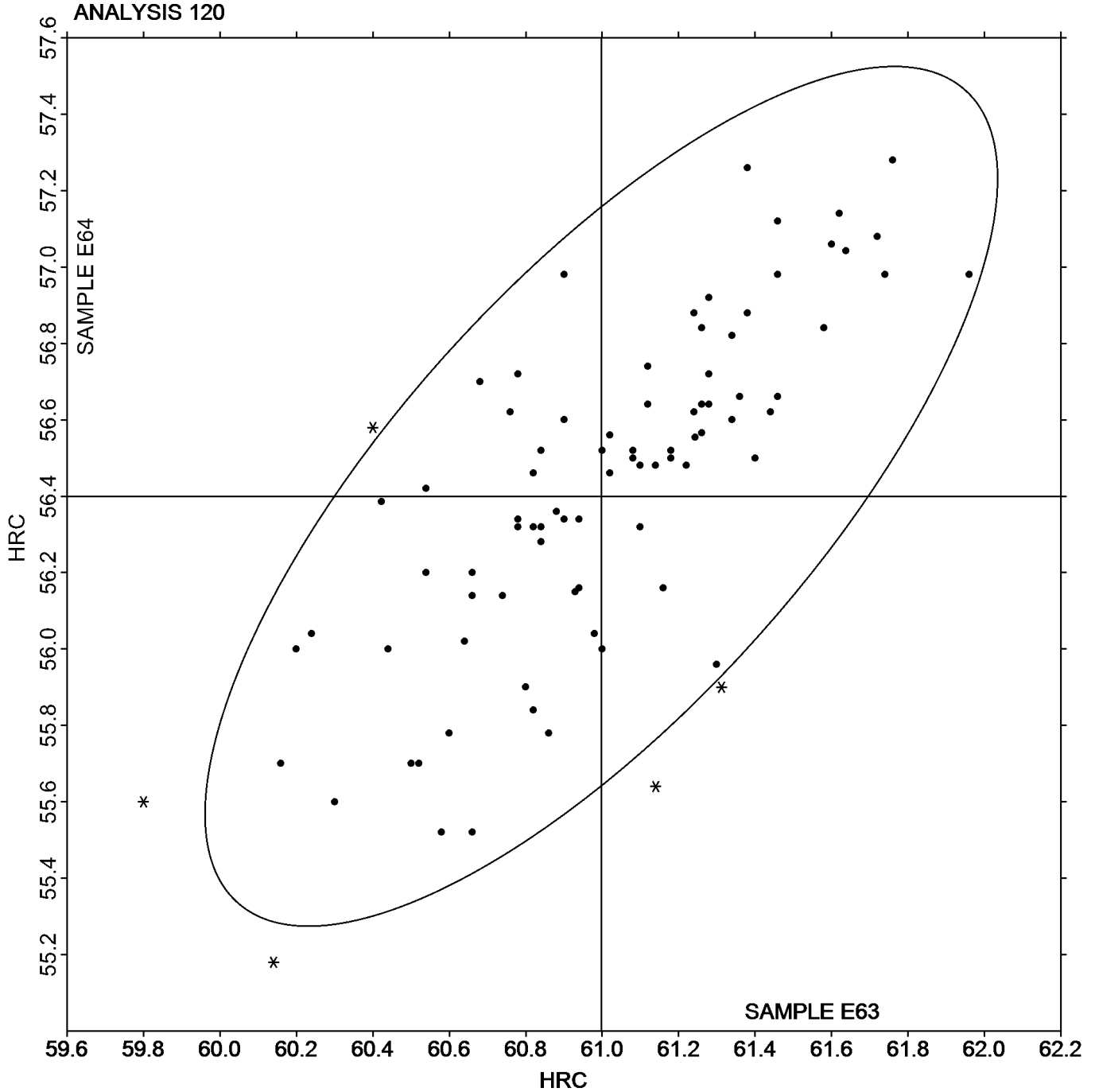
Rockwell Hardness: C Scale
ASTM E18

SAMPLE E63

SAMPLE E64

61.00 HRC

56.40 HRC





Fasteners and Metals Interlaboratory Testing Program

Analysis 125

Cycle 128
4th Qtr 2019

Rockwell Hardness: Externally Threaded Fasteners ASTM F606/F606M AND ASTM E18

WebCode	Data Flag	Sample G63			Sample G64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
22C74Y	X	25.87	-4.76	-6.35	30.18	-0.20	-0.34
2EP3QF	*	32.60	1.97	2.63	31.60	1.21	2.02
2JELT7	X	28.37	-2.26	-3.02	28.19	-2.20	-3.67
3EHFL8		30.17	-0.46	-0.61	30.04	-0.35	-0.58
49CWAZ		30.59	-0.04	-0.05	30.44	0.06	0.10
4A2GJC		29.78	-0.85	-1.13	29.38	-1.01	-1.68
4XN9UY		29.75	-0.88	-1.17	30.00	-0.38	-0.64
6AY6JM	*	28.84	-1.79	-2.39	30.31	-0.07	-0.12
6BVFJW		29.78	-0.85	-1.13	29.29	-1.10	-1.83
7889UT		29.83	-0.80	-1.07	28.94	-1.44	-2.41
87B892		31.00	0.37	0.50	30.41	0.03	0.05
8CEDM6	X	29.40	-1.23	-1.64	27.46	-2.92	-4.88
8N9MCY		29.94	-0.68	-0.91	30.29	-0.10	-0.16
8P4946		31.68	1.05	1.41	31.10	0.72	1.20
979VBX		31.29	0.67	0.89	30.87	0.48	0.81
9XVNBQ		30.01	-0.62	-0.82	30.18	-0.20	-0.34
AJRW7V		29.85	-0.78	-1.04	30.29	-0.09	-0.15
C668KX		30.96	0.33	0.45	29.96	-0.42	-0.70
CKYVD9		30.03	-0.60	-0.80	29.70	-0.68	-1.14
CRFEVM		30.71	0.08	0.11	30.10	-0.28	-0.47
CX8LDV		30.48	-0.15	-0.20	30.87	0.48	0.81
CZANVK		31.39	0.76	1.02	30.91	0.53	0.88
D2XHCL		31.20	0.57	0.76	29.89	-0.49	-0.82
D3WJFR		30.59	-0.04	-0.05	30.40	0.02	0.03
DVW4NY		29.84	-0.78	-1.05	30.71	0.32	0.54
DYBQEX		29.73	-0.90	-1.20	29.82	-0.57	-0.94
E4HV89		30.36	-0.27	-0.36	30.21	-0.18	-0.30
EPH4QX		30.39	-0.23	-0.31	29.80	-0.58	-0.98
F34GLK		30.90	0.27	0.36	30.81	0.43	0.72
F6Q4CM		29.66	-0.97	-1.30	30.11	-0.28	-0.46
FGN36E		31.80	1.17	1.56	31.13	0.75	1.25
FHKD2G		29.77	-0.86	-1.15	30.26	-0.13	-0.21
G2Q89E		31.08	0.45	0.60	30.01	-0.37	-0.62
GY3V8M		29.84	-0.78	-1.05	29.81	-0.58	-0.96
H924AQ		30.60	-0.03	-0.04	30.09	-0.30	-0.49
JRWWVN		30.89	0.27	0.35	29.87	-0.52	-0.86
KD984W		31.38	0.75	1.01	30.84	0.46	0.77
KJFRDN	X	33.66	3.03	4.04	30.69	0.30	0.51
L734JG		30.02	-0.60	-0.81	29.84	-0.55	-0.92
LMB3J8		29.81	-0.82	-1.10	30.42	0.03	0.06
NE7XNT		31.39	0.76	1.01	29.98	-0.41	-0.68
NE9NXW		30.56	-0.07	-0.10	30.36	-0.03	-0.05
NGYP3K		29.84	-0.78	-1.05	30.36	-0.02	-0.04
P8QE8F		31.46	0.83	1.11	31.56	1.18	1.97
P9CAHL		30.05	-0.58	-0.77	30.31	-0.07	-0.12
PCGNPD		30.41	-0.22	-0.29	30.29	-0.10	-0.16
PW6HYM		30.43	-0.20	-0.26	30.16	-0.23	-0.38



Fasteners and Metals Interlaboratory Testing Program
Analysis 125

Cycle 128
4th Qtr 2019

Rockwell Hardness: Externally Threaded Fasteners
ASTM F606/F606M AND ASTM E18

WebCode	Data Flag	Sample G63			Sample G64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
QFBEPW		29.59	-1.04	-1.39	29.98	-0.41	-0.68
QQXYMF		30.43	-0.20	-0.26	30.33	-0.06	-0.10
QR999K		30.88	0.25	0.34	30.28	-0.10	-0.17
QRQYH6		30.97	0.34	0.45	30.68	0.30	0.50
RQB48X		30.55	-0.08	-0.10	30.99	0.61	1.02
T6AG6T		32.12	1.49	1.99	30.98	0.60	1.00
TKEZTJ		31.07	0.44	0.59	31.11	0.73	1.22
TM6Y93		30.68	0.05	0.07	30.85	0.47	0.78
URBAH9		31.37	0.74	0.99	31.36	0.97	1.62
V9WUYT		31.24	0.61	0.81	31.67	1.28	2.15
VABNBM		31.38	0.75	1.01	30.44	0.05	0.09
W77BBZ	*	31.96	1.33	1.77	31.99	1.60	2.68
W8X6WJ		30.85	0.22	0.30	31.04	0.65	1.09
WGT6NH		30.94	0.31	0.41	30.75	0.37	0.61
WXWQ6J		31.02	0.39	0.52	29.74	-0.65	-1.08
X4HYAA		31.14	0.51	0.68	30.95	0.57	0.95
X8H8F6		29.96	-0.67	-0.90	29.27	-1.11	-1.86
XBYMRH		30.46	-0.17	-0.22	30.14	-0.24	-0.40
XX3LVF		30.16	-0.47	-0.63	29.94	-0.44	-0.73
YJR3AU		30.68	0.05	0.06	30.04	-0.35	-0.58
YLYDB6	*	32.78	2.15	2.87	31.41	1.02	1.71
YTE22Z		30.78	0.15	0.20	29.86	-0.52	-0.87
YY2Z7E		29.81	-0.82	-1.09	29.94	-0.45	-0.75
Z7FA2E		31.02	0.39	0.52	30.19	-0.20	-0.33
Z94VLP		30.70	0.07	0.10	30.62	0.23	0.39
ZMYBDH		30.13	-0.50	-0.67	30.25	-0.13	-0.22

Summary Statistics						
	Sample G63			Sample G64		
Grand Means	30.63	HRC		30.38	HRC	
Std Dev Btwn Labs	0.75	HRC		0.60	HRC	

Samples G63, G64 : 1/2-20 x 2 1/2, 1/2-20 x 2 1/2

Statistics based on 69 of 73 reporting participants

Comments on Assigned Data Flags for Test #125

22C74Y (X) - Data for sample G63 are low. Inconsistent within the determinations of sample G63.

2JELT7 (X) - Data for both samples are low.

8CEDM6 (X) - Data for sample G64 are low. Inconsistent within the determinations of both samples.

KJFRDN (X) - Data for sample G63 are high.



Analysis 125

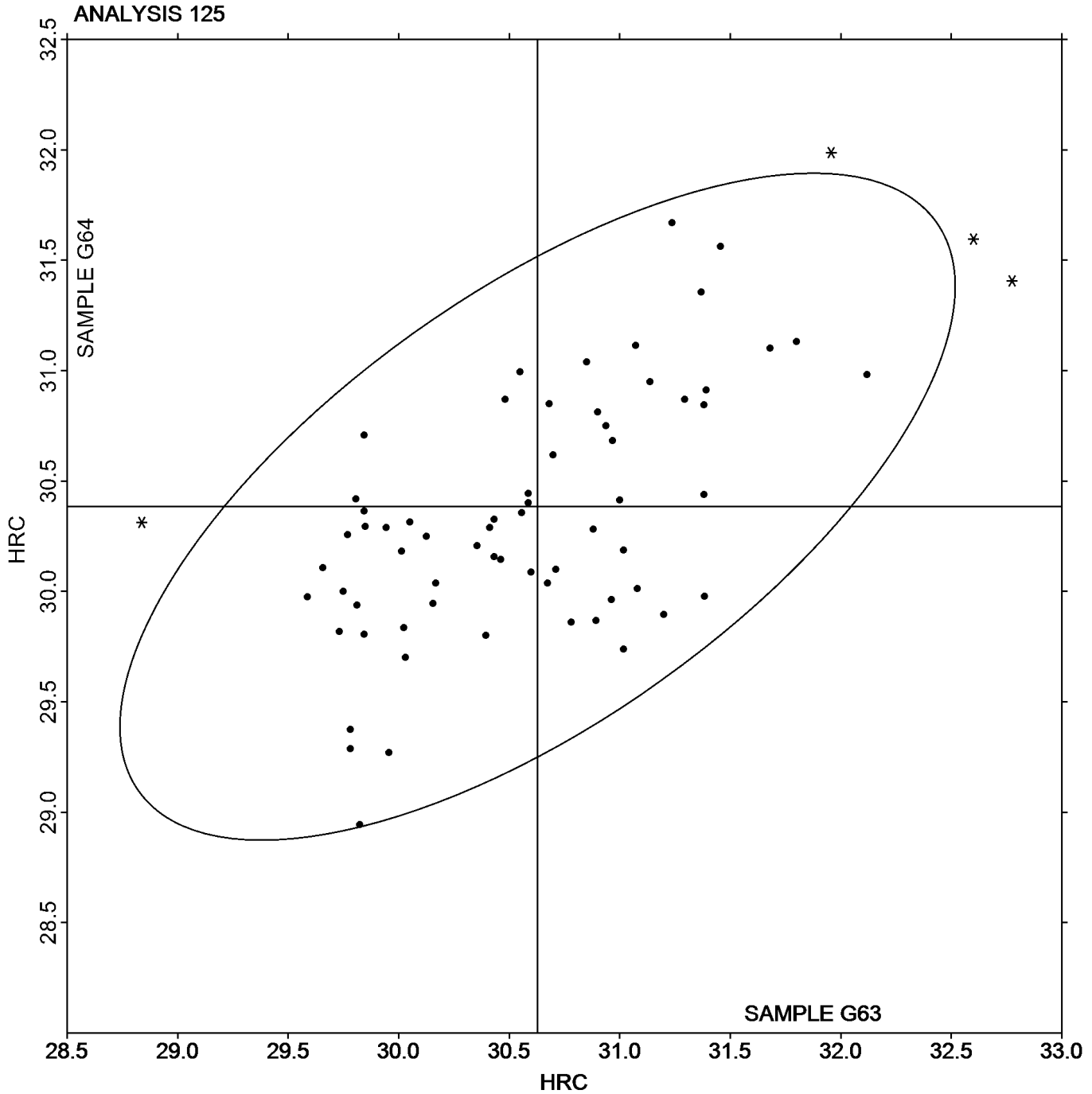
Rockwell Hardness: Externally Threaded Fasteners
ASTM F606/F606M AND ASTM E18

SAMPLE G63

30.63 HRC

SAMPLE G64

30.38 HRC





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 126

Vickers Hardness: Externally Threaded Fasteners
ASTM E92

WebCode	Data Flag	Sample V63			Sample V64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
4A2GJC		309.83	4.49	1.14	311.78	5.05	0.92
4XN9UY		301.69	-3.65	-0.93	302.69	-4.04	-0.74
979VBX		307.78	2.44	0.62	310.85	4.12	0.75
B9N7V8		304.75	-0.59	-0.15	309.31	2.58	0.47
BRJKTK		299.45	-5.89	-1.50	302.29	-4.44	-0.81
D3WJFR		303.63	-1.71	-0.44	303.31	-3.42	-0.62
DLNKBV		309.40	4.06	1.03	314.86	8.13	1.48
E4HV89	*	317.28	11.94	3.04	323.79	17.06	3.10
EK4CCQ		307.19	1.85	0.47	315.94	9.21	1.68
G2A9W2		309.50	4.16	1.06	311.56	4.83	0.88
JRWVVN		306.06	0.73	0.18	306.69	-0.04	-0.01
L734JG		306.63	1.29	0.33	307.56	0.83	0.15
Q4KKFN		307.75	2.41	0.61	304.81	-1.92	-0.35
QR999K		308.50	3.16	0.81	306.56	-0.17	-0.03
R2UR7Q		302.50	-2.84	-0.72	302.38	-4.35	-0.79
RWAMEU		301.51	-3.82	-0.97	298.76	-7.97	-1.45
TER6VL		300.19	-5.15	-1.31	302.69	-4.04	-0.74
VL4ZQ7		303.69	-1.65	-0.42	303.69	-3.04	-0.55
VMGG3Y		306.92	1.58	0.40	307.15	0.42	0.08
VXAYHZ		301.29	-4.04	-1.03	300.89	-5.83	-1.06
W9G9NH		300.88	-4.46	-1.14	304.69	-2.04	-0.37
WP2N48		301.00	-4.34	-1.10	304.56	-2.17	-0.39
XMQ96Z		307.97	2.63	0.67	311.16	4.43	0.81
YEUP4W		303.96	-1.38	-0.35	302.46	-4.27	-0.78
YJR3AU		306.88	1.54	0.39	304.81	-1.92	-0.35
YPP244		304.63	-0.71	-0.18	304.00	-2.73	-0.50
ZMYBDH		303.28	-2.06	-0.52	302.41	-4.32	-0.79

Summary Statistics

	Sample V63		Sample V64	
Grand Means	305.34	HV	306.73	HV
Std Dev Btwn Labs	3.93	HV	5.50	HV

Samples V63, V64 : 1/2-20 x 2 1/2, 1/2-20 x 2 1/2

Statistics based on 27 of 27 reporting participants



Analysis 126

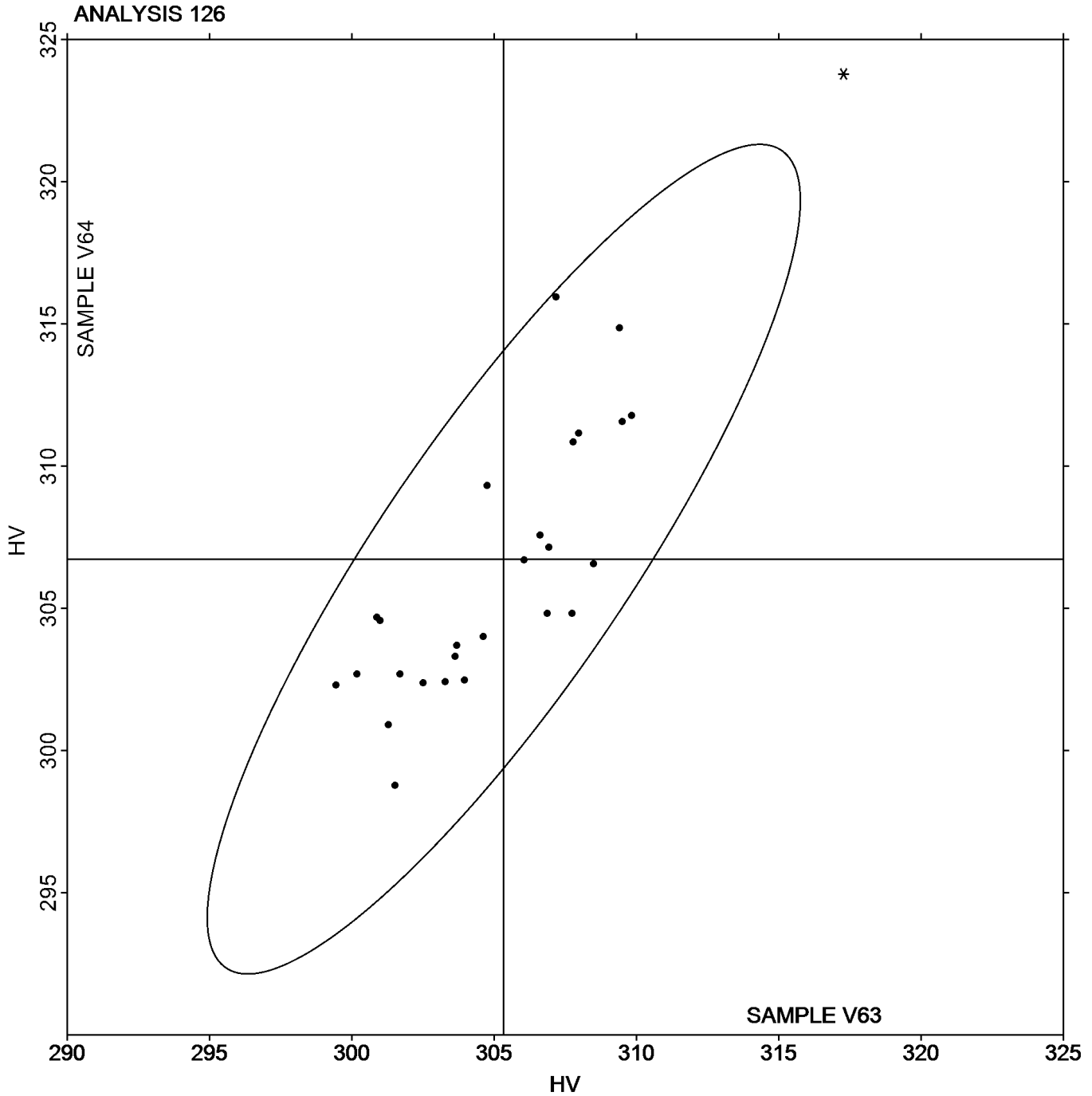
Vickers Hardness: Externally Threaded Fasteners
ASTM E92

SAMPLE V63

SAMPLE V64

305.34 HV

306.73 HV





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 127

Fastener Wedge Tensile (10 degree) - Metric
ASTM F606M

WebCode	Data Flag	Sample B63			Sample B64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
22C74Y		1,125	-16	-1.46	1,132	-11	-0.84
2EP3QF		1,135	-6	-0.56	1,142	-1	-0.05
3EHFL8		1,137	-5	-0.41	1,126	-17	-1.26
4A2GJC		1,135	-6	-0.56	1,137	-6	-0.45
7MKL4E		1,145	4	0.32	1,141	-2	-0.17
8CEDM6		1,167	25	2.27	1,157	14	1.02
8YDM2Z		1,145	4	0.32	1,163	20	1.49
979VBX		1,136	-5	-0.50	1,124	-19	-1.44
AJRW7V		1,147	6	0.53	1,153	10	0.73
CRFEVM		1,145	4	0.35	1,128	-15	-1.12
D2XHCL		1,146	5	0.44	1,170	27	2.01
D7DRJX		1,126	-15	-1.40	1,144	1	0.08
E2W3CU		1,137	-5	-0.44	1,143	0	0.00
FGN36E		1,146	4	0.38	1,152	9	0.67
LMB3J8		1,147	5	0.45	1,138	-5	-0.37
NGYP3K		1,134	-8	-0.70	1,145	2	0.19
P9CAHL		1,155	14	1.25	1,149	6	0.45
QFBEPW		1,135	-6	-0.59	1,139	-4	-0.32
R2UR7Q		1,126	-15	-1.37	1,137	-6	-0.42
RQB48X		1,124	-17	-1.58	1,121	-22	-1.66
TKEZTJ		1,137	-4	-0.38	1,134	-9	-0.64
TM6Y93		1,140	-1	-0.10	1,145	2	0.11
VABNBM		1,140	-2	-0.16	1,132	-11	-0.84
VL4ZQ7		1,159	17	1.55	1,149	6	0.47
WP2N48		1,145	4	0.34	1,141	-2	-0.12
ZMYBDH		1,164	22	2.00	1,176	33	2.46

Summary Statistics

	Sample B63		Sample B64	
Grand Means	1,141	MPa	1,143	MPa
Stnd Dev Btwn Labs	11	MPa	13	MPa

Samples B63, B64 : M-10x1.5x70, M-10x1.5x70

Statistics based on 26 of 26 reporting participants



Analysis 127

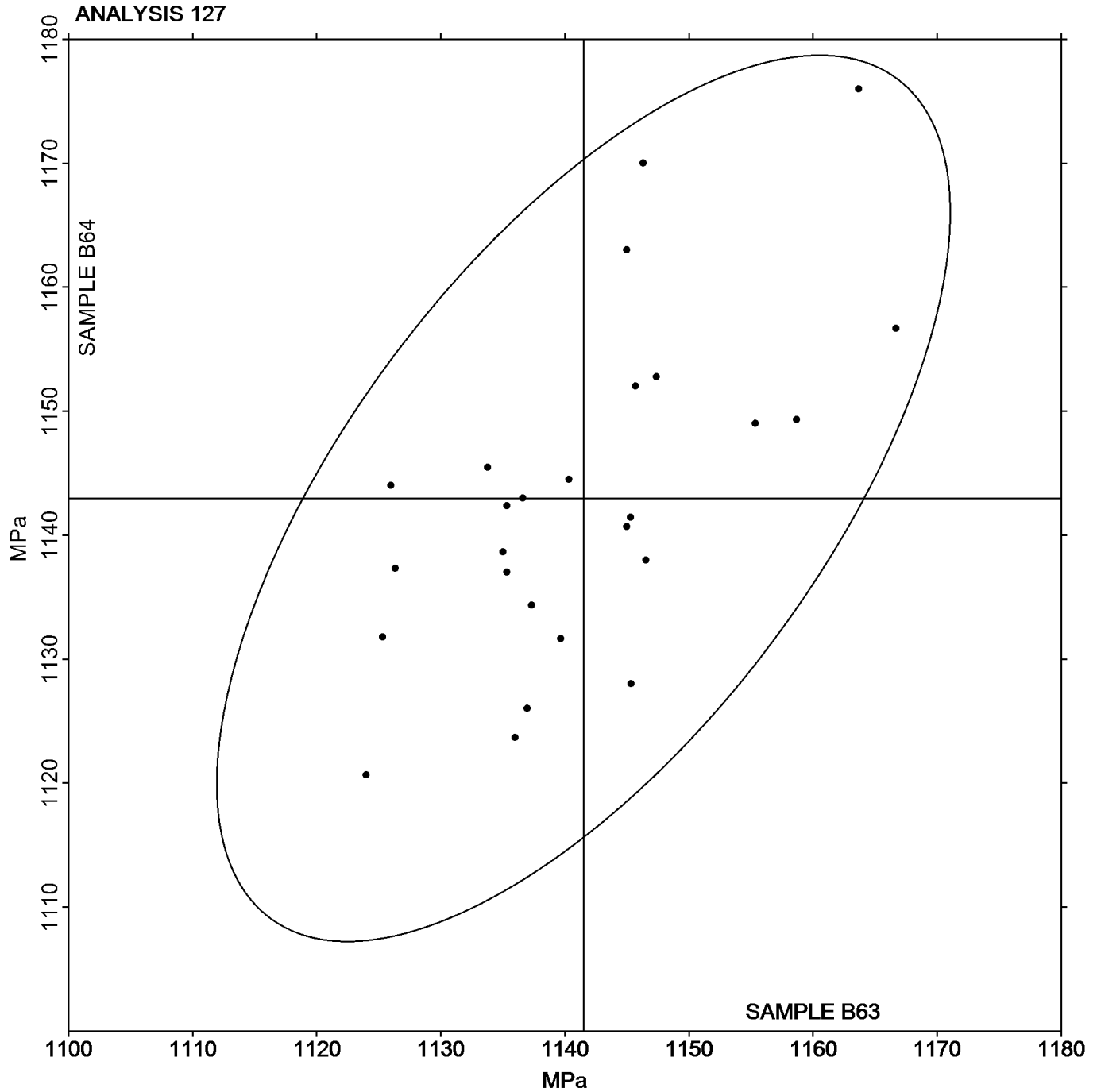
Fastener Wedge Tensile (10 degree) - Metric
ASTM F606M

SAMPLE B63

SAMPLE B64

1,141 MPa

1,143 MPa





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 128

Fastener Axial Tensile - Metric
ASTM F606M

WebCode	Data Flag	Sample T63			Sample T64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
4A2GJC		1,148	11	0.86	1,138	-4	-0.48
8P4946		1,148	11	0.88	1,147	5	0.57
B3D6NH		1,136	0	-0.03	1,143	2	0.19
E2W3CU		1,146	9	0.72	1,144	2	0.23
E4HV89		1,123	-14	-1.06	1,132	-9	-1.10
FGN36E		1,146	10	0.75	1,159	17	2.05
KD984W		1,152	16	1.20	1,146	5	0.55
NE9NXW		1,141	4	0.32	1,146	4	0.51
QFBEPW		1,139	3	0.22	1,134	-8	-0.96
RWAMEU		1,113	-24	-1.83	1,131	-11	-1.28
T6AG6T		1,131	-6	-0.43	1,148	6	0.71
TTMKMF		1,144	8	0.60	1,147	6	0.67
VL4ZQ7		1,128	-9	-0.66	1,140	-2	-0.24
WP2N48		1,145	9	0.66	1,148	6	0.74
YPP244		1,108	-29	-2.22	1,141	-1	-0.09
Z94VLP		1,137	0	0.01	1,124	-17	-2.07

Summary Statistics

	Sample T63		Sample T64	
Grand Means	1,137	MPa	1,142	MPa
Stnd Dev Brwn Labs	13	MPa	8	MPa

Samples T63, T64 : M-10x1.5x70, M-10x1.5x70

Statistics based on 16 of 16 reporting participants



Analysis 128

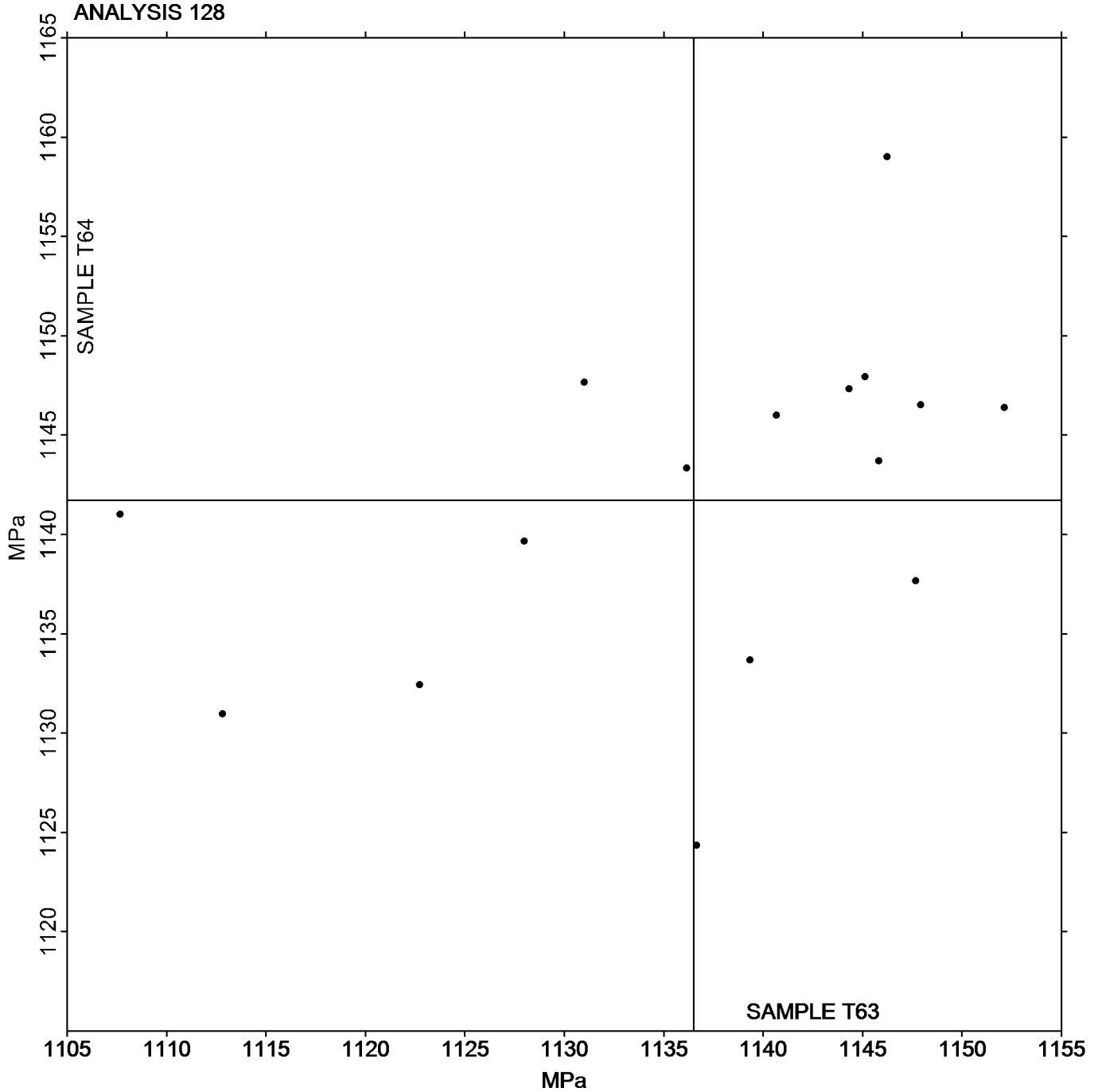
Fastener Axial Tensile - Metric
ASTM F606M

SAMPLE T63

SAMPLE T64

1,137 MPa

1,142 MPa





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 129

Fastener Double Shear
NASM 1312-13

WebCode	Data Flag	Sample Z63			Sample Z64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
87B892		18,932	-33	-0.07	18,957	5	0.01
9JGMRC		19,213	249	0.52	19,203	251	0.64
BEQAVD		18,880	-85	-0.18	19,030	78	0.20
CRFEVM		19,470	505	1.06	19,187	235	0.60
E6X79M		18,422	-542	-1.14	18,529	-423	-1.08
F34GLK		18,985	21	0.04	19,134	182	0.46
F6Q4CM		18,783	-182	-0.38	18,787	-165	-0.42
G2Q89E		18,721	-244	-0.51	18,957	5	0.01
HF4XNR		18,159	-806	-1.69	18,242	-710	-1.81
JHP78R		19,609	645	1.35	19,284	332	0.85
KD984W		19,201	237	0.50	19,251	299	0.76
L77DPV		18,233	-731	-1.53	18,300	-652	-1.66
NE7XNT		19,983	1,019	2.14	19,767	815	2.08
NET9LG		18,567	-398	-0.83	18,600	-352	-0.90
P8QE8F		18,867	-98	-0.21	18,633	-319	-0.81
QR999K		18,869	-96	-0.20	18,835	-118	-0.30
VFXDUW		19,310	346	0.73	19,245	293	0.75
YLYDB6	X	87,243	68,279	143.25	88,741	69,789	178.06
YTE22Z		19,489	525	1.10	19,431	479	1.22
YY2Z7E		18,632	-333	-0.70	18,720	-232	-0.59

Summary Statistics

	Sample Z63		Sample Z64	
Grand Means	18,965	1b	18,952	1b
Stnd Dev Btwn Labs	477	1b	392	1b

Samples Z63, Z64 : 3/8-16 x 2 1/4, 3/8-16 x 2 1/4

Statistics based on 19 of 20 reporting participants

Comments on Assigned Data Flags for Test #129

YLYDB6 (X) - Extreme data.



Analysis 129

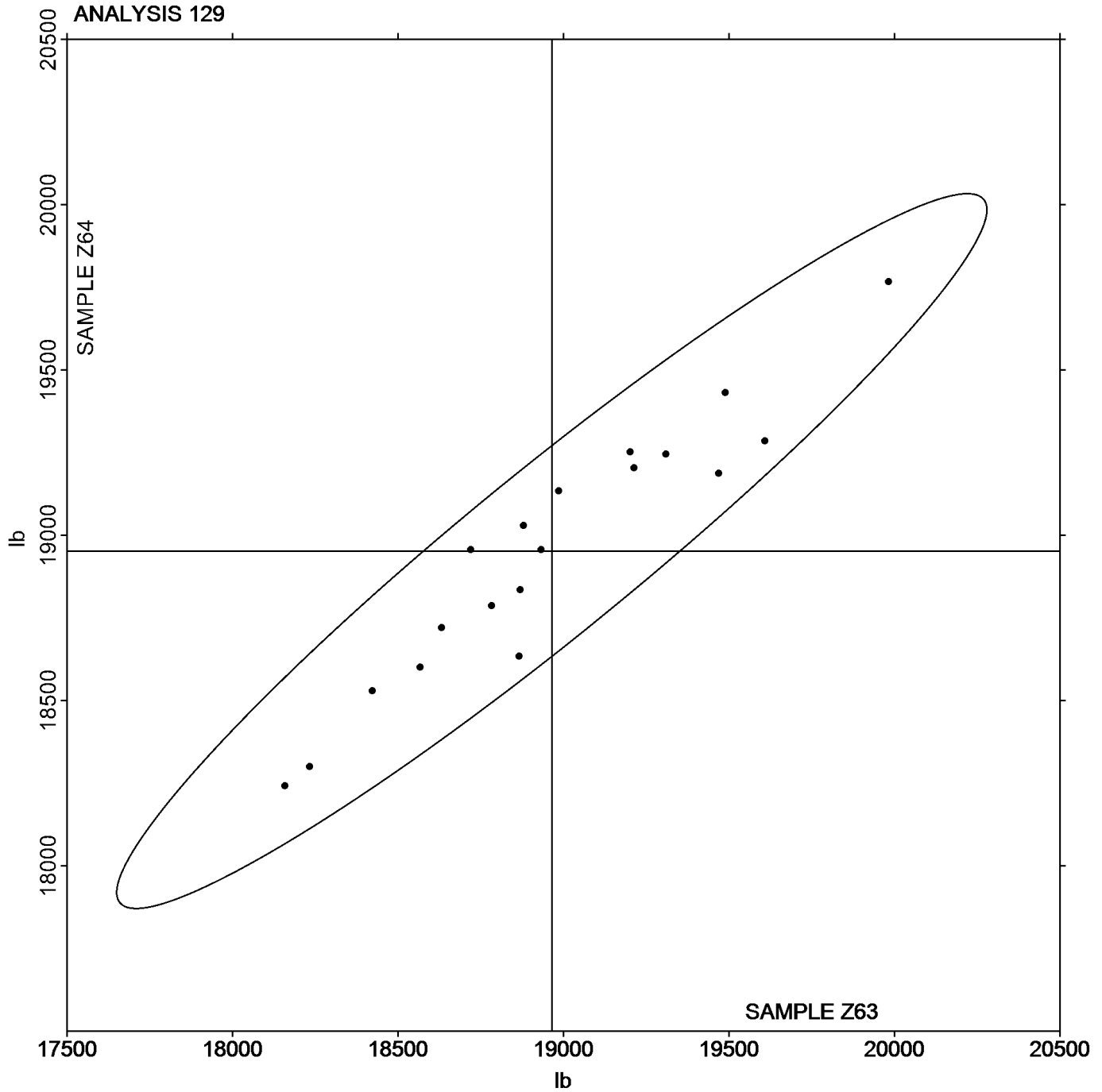
Fastener Double Shear
NASM 1312-13

SAMPLE Z63

SAMPLE Z64

18,965 lb

18,952 lb





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 130

Tensile Strength: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
29PYEU		78.10	-0.74	-0.85	75.37	0.77	0.74
2CHKU6		78.00	-0.84	-0.96	73.30	-1.31	-1.26
2E7EB7		78.31	-0.53	-0.61	74.78	0.18	0.17
32K3WB		79.70	0.86	0.98	74.90	0.29	0.28
34M6FL		78.00	-0.84	-0.96	74.00	-0.61	-0.58
37JRW3		79.96	1.12	1.27	74.96	0.36	0.34
42BPLK		78.20	-0.64	-0.73	74.10	-0.51	-0.49
47K6V9		78.42	-0.42	-0.48	73.61	-1.00	-0.96
496ZE3		78.00	-0.84	-0.96	75.70	1.09	1.05
4MBV6J		78.67	-0.17	-0.19	75.65	1.04	1.00
4PKVDW		78.16	-0.68	-0.77	74.96	0.35	0.34
4R33MR	X	77.81	-1.03	-1.17	77.88	3.27	3.15
4V44UG		79.10	0.26	0.30	75.90	1.29	1.24
62NHXE		79.30	0.46	0.52	75.80	1.19	1.15
632BRF		78.10	-0.74	-0.84	74.50	-0.11	-0.10
6DFC4F		78.80	-0.04	-0.05	75.30	0.69	0.67
6TNGY8		79.60	0.76	0.86	74.49	-0.11	-0.11
6U6FQC		79.10	0.26	0.30	75.20	0.60	0.57
7BJAK6		78.32	-0.52	-0.59	73.39	-1.22	-1.17
7GBG3D		78.99	0.15	0.17	74.05	-0.55	-0.53
7NA6TH		78.90	0.06	0.07	75.90	1.29	1.24
7QXHJN		79.10	0.26	0.30	75.14	0.53	0.51
7UXRL3		78.00	-0.84	-0.96	74.60	-0.01	-0.01
7VUD93		77.70	-1.14	-1.30	72.50	-2.11	-2.02
8GRYUQ		78.40	-0.44	-0.50	73.60	-1.01	-0.97
8JC4V9		78.26	-0.58	-0.66	74.60	0.00	0.00
8MJ7DY		78.78	-0.06	-0.07	73.78	-0.83	-0.80
8TNXNH	*	77.45	-1.39	-1.58	72.00	-2.61	-2.50
9D43KQ		79.08	0.24	0.27	75.26	0.65	0.63
9K2RTU		79.80	0.96	1.09	74.90	0.29	0.28
9L47TA	*	81.51	2.67	3.04	76.29	1.68	1.62
9LYU8Y		78.60	-0.24	-0.27	75.80	1.19	1.15
A62FPH		78.40	-0.44	-0.50	75.60	0.99	0.96
A8PMDL	X	81.40	2.56	2.91	74.40	-0.21	-0.20
BKAN9J	*	77.50	-1.34	-1.53	75.64	1.03	0.99
BPRL4Z		79.37	0.53	0.60	74.14	-0.46	-0.44
BQM77R	X	103.12	24.28	27.64	98.34	23.73	22.81
BRJKTK		78.32	-0.52	-0.59	73.39	-1.22	-1.17
BUKP4K	M	No Data Reported			75.40	0.79	0.76
C2MCG7		79.10	0.26	0.30	75.80	1.19	1.15
CE8RK6		78.70	-0.14	-0.16	75.10	0.49	0.48
CEPWMB		77.39	-1.45	-1.65	72.59	-2.02	-1.94
CJZVA3		78.69	-0.15	-0.17	74.33	-0.28	-0.27
CRDPKY		78.60	-0.24	-0.27	73.30	-1.31	-1.26
DE4DNV		78.90	0.06	0.07	74.70	0.09	0.09
DFXA2W		78.57	-0.27	-0.31	75.33	0.72	0.69
DJA9AQ		77.71	-1.13	-1.29	74.06	-0.55	-0.52



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 130

Tensile Strength: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
DJY8LX		79.30	0.46	0.52	75.10	0.49	0.48
DYBQEX		78.70	-0.14	-0.16	73.60	-1.01	-0.97
DYUK3E		78.60	-0.24	-0.27	74.20	-0.41	-0.39
E8FCGH		79.00	0.16	0.18	73.00	-1.61	-1.54
E8G3R7	*	77.35	-1.49	-1.70	76.06	1.45	1.40
EK4CCQ		78.61	-0.23	-0.26	74.84	0.23	0.23
ELXYY3		80.10	1.26	1.43	75.00	0.39	0.38
EQR3WZ		79.91	1.07	1.22	74.59	-0.02	-0.02
F3LT26		77.00	-1.84	-2.09	73.30	-1.31	-1.26
F98NX3	M	No Data Reported			76.40	1.79	1.72
FJRUXR		79.00	0.16	0.18	73.00	-1.61	-1.54
G89XWT		79.12	0.28	0.32	74.95	0.34	0.33
GFAW3A		78.29	-0.55	-0.62	74.84	0.23	0.23
H9U8GD	X	77.56	-1.28	-1.45	71.05	-3.56	-3.42
HJKHDT		78.98	0.14	0.16	75.27	0.66	0.64
HXDFVP		79.77	0.93	1.06	75.42	0.81	0.78
J3KB7C		79.00	0.16	0.18	75.30	0.69	0.67
JCZQDE	X	112.50	33.66	38.31	74.30	-0.31	-0.29
JNC24P		79.70	0.86	0.98	73.90	-0.71	-0.68
JVMGE7		79.00	0.16	0.18	74.50	-0.11	-0.10
JWWLRU		79.30	0.46	0.52	74.80	0.19	0.19
JYF83X		78.47	-0.37	-0.42	73.63	-0.97	-0.93
JYQ7W7		78.32	-0.52	-0.59	73.46	-1.14	-1.10
K9DGXL	*	81.20	2.36	2.69	74.90	0.29	0.28
KMFV9G		77.60	-1.24	-1.41	73.40	-1.21	-1.16
KZ8HGX		78.74	-0.10	-0.11	75.76	1.15	1.11
L6PCPE		79.22	0.38	0.43	75.59	0.99	0.95
LNEW3K		79.45	0.61	0.69	75.30	0.69	0.67
LNMTVW		78.50	-0.34	-0.39	72.81	-1.80	-1.73
LV646R		79.40	0.56	0.64	73.80	-0.81	-0.77
MKKZCY	X	76.03	-2.81	-3.20	71.45	-3.16	-3.03
MTP9RY	*	76.20	-2.64	-3.00	73.30	-1.31	-1.26
NU28QD	*	80.72	1.88	2.14	77.36	2.75	2.64
P6YMTN		80.20	1.36	1.55	75.10	0.49	0.48
P7CW4A		79.90	1.06	1.21	74.40	-0.21	-0.20
PE4KTK		78.80	-0.04	-0.05	74.80	0.19	0.19
PEMHPH		78.90	0.06	0.07	74.10	-0.51	-0.49
QFXF4Z		77.80	-1.04	-1.18	73.60	-1.01	-0.97
QGQD8Z		78.47	-0.37	-0.43	73.68	-0.93	-0.89
QH2FTY		78.20	-0.64	-0.73	74.60	-0.01	-0.01
QHNW2E		80.13	1.29	1.47	74.55	-0.06	-0.05
QJ8WVB		79.10	0.26	0.30	72.80	-1.81	-1.74
QK4HGE		79.80	0.96	1.09	76.80	2.19	2.11
QK8WCN		77.80	-1.04	-1.18	73.90	-0.71	-0.68
R2TR9B		78.90	0.06	0.07	74.10	-0.51	-0.49
R69B6Y		78.90	0.06	0.07	74.80	0.19	0.19
RGPVQG		78.20	-0.64	-0.73	74.60	-0.01	-0.01



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 130

Tensile Strength: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
RPCZG3		78.60	-0.24	-0.27	74.90	0.29	0.28
RTRPKC	M	No Data Reported			75.50	0.89	0.86
TDKUYH		78.70	-0.14	-0.16	75.20	0.59	0.57
TNNVPA		78.30	-0.54	-0.61	74.60	-0.01	-0.01
UZ626G		78.80	-0.04	-0.05	72.50	-2.11	-2.02
UZAR2R		78.80	-0.04	-0.05	73.10	-1.51	-1.45
V3MU7A		79.13	0.29	0.33	73.85	-0.75	-0.72
VQTEG9		78.87	0.03	0.03	74.56	-0.05	-0.05
VTJP92		79.18	0.34	0.39	76.23	1.63	1.56
W73VTT	X	84.20	5.36	6.10	81.52	6.92	6.65
W8VLY8		78.40	-0.44	-0.50	74.90	0.29	0.28
WYGW72	M	No Data Reported			74.10	-0.51	-0.49
X8GG6F		79.00	0.16	0.18	74.20	-0.41	-0.39
XHZ2E6		80.41	1.57	1.79	75.69	1.09	1.05
XV3K3X		78.10	-0.74	-0.84	74.70	0.09	0.09
YBCJV2		78.50	-0.34	-0.39	75.50	0.89	0.86
YE8FZU	*	81.40	2.56	2.91	76.99	2.38	2.29
YWF6V8		78.50	-0.34	-0.39	74.60	-0.01	-0.01
Z6LLJJ		80.40	1.56	1.78	77.10	2.49	2.40
ZA7RWR		78.98	0.14	0.16	74.71	0.10	0.10
ZHZWPT		78.06	-0.78	-0.89	73.87	-0.74	-0.71
ZMYBDH		79.57	0.73	0.83	74.53	-0.08	-0.07
ZYUE2B		80.05	1.21	1.37	75.35	0.74	0.72

Summary Statistics

	Sample F63		Sample F64	
Grand Means	78.84	ksi	74.61	ksi
Stnd Dev Btwn Labs	0.88	ksi	1.04	ksi

Samples F63, F64 : AISI 4130 - 12G, AISI 4130 - 14G

Statistics based on 106 of 117 reporting participants



Comments on Assigned Data Flags for Test #130

- 4R33MR (X) - Data for sample F64 are high.
- A8PMDL (X) - Data for sample F63 are high.
- BQM77R (X) - Data for both samples are extremely high.
- BUKP4K (M) - Participant did not submit data for sample F63.
- F98NX3 (M) - Participant did not submit data for sample F63.
- H9U8GD (X) - Data for sample F64 are low.
- JCZQDE (X) - Data for sample F63 are extremely high.
- MKKZCY (X) - Data for both samples are low.
- RTRPKC (M) - Participant did not submit data for sample F63.
- W73VTT (X) - Data for both samples are high.
- WYGW72 (M) - Participant did not submit data for sample F63.



Analysis 130

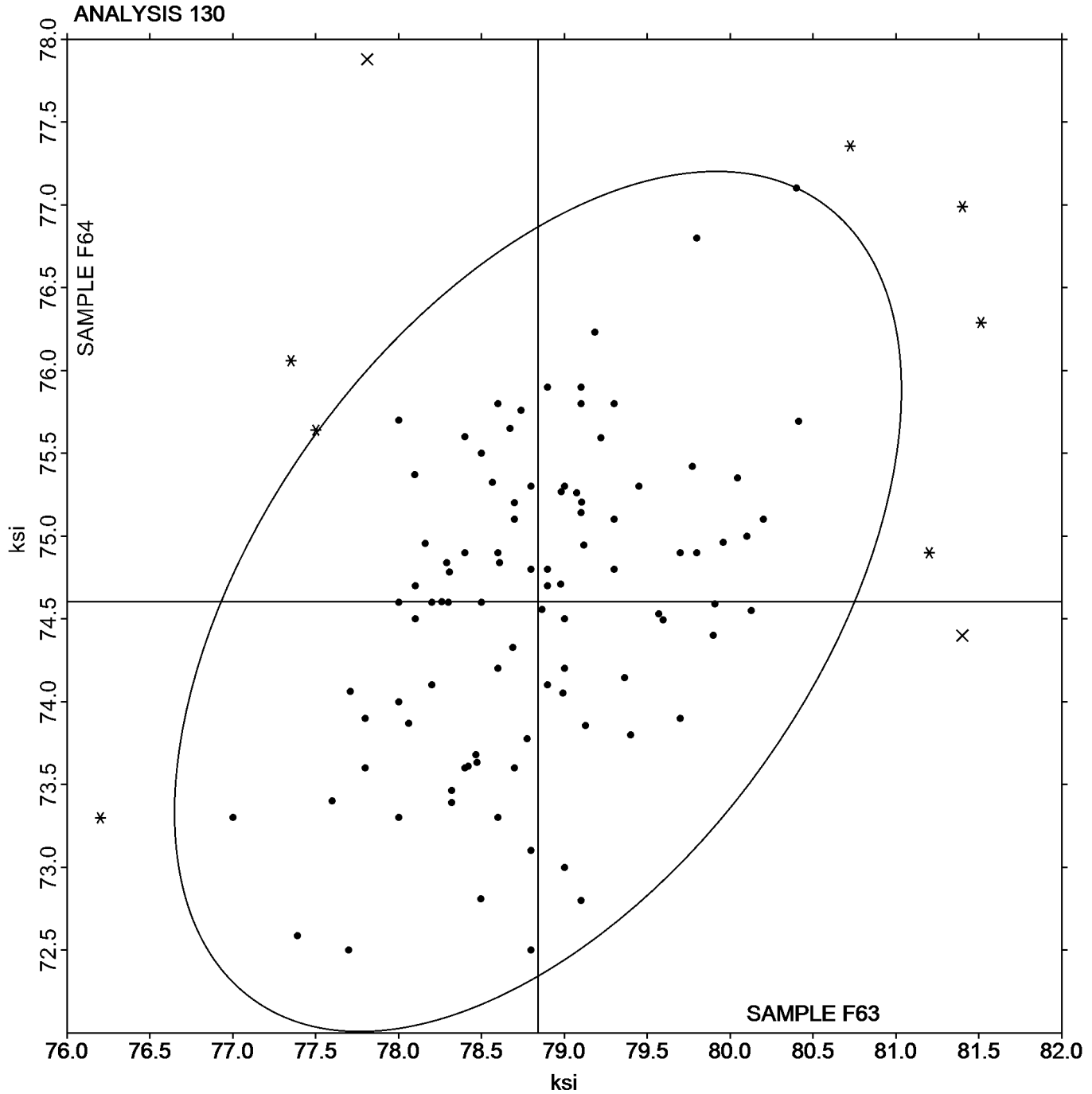
Tensile Strength: Lab-Machined Flat Steel
ASTM E8

SAMPLE F63

SAMPLE F64

78.84 ksi

74.61 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 131

Yield Strength: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
29PYEU	X	58.59	4.09	1.98	42.17	-3.48	-2.78
2CHKU6		53.30	-1.20	-0.58	44.60	-1.05	-0.84
2E7EB7		52.78	-1.72	-0.83	45.60	-0.05	-0.04
32K3WB		55.50	1.00	0.49	44.90	-0.75	-0.60
34M6FL		50.90	-3.60	-1.74	44.80	-0.85	-0.68
37JRW3		56.35	1.86	0.90	47.29	1.63	1.30
42BPLK		56.30	1.80	0.87	45.00	-0.65	-0.52
47K6V9		55.86	1.36	0.66	46.74	1.09	0.87
496ZE3	*	56.10	1.60	0.78	49.10	3.45	2.75
4MBV6J		54.40	-0.10	-0.05	46.63	0.97	0.78
4PKVDW		56.33	1.84	0.89	45.66	0.00	0.00
4R33MR		54.89	0.39	0.19	44.18	-1.47	-1.17
4V44UG		52.60	-1.90	-0.92	44.90	-0.75	-0.60
62NHXE		51.10	-3.40	-1.65	47.90	2.25	1.79
632BRF		56.70	2.20	1.07	45.90	0.25	0.20
6DFC4F		56.50	2.00	0.97	47.70	2.05	1.63
6TNGY8		56.42	1.92	0.93	44.76	-0.89	-0.71
6U6FQC		54.38	-0.12	-0.06	45.96	0.31	0.25
7BJAK6		54.97	0.47	0.23	46.99	1.34	1.07
7GBG3D		56.14	1.65	0.80	45.22	-0.43	-0.34
7NA6TH		54.50	0.00	0.00	46.90	1.25	0.99
7QXHJN		52.69	-1.81	-0.88	48.55	2.90	2.31
7UXRL3		52.10	-2.40	-1.16	46.00	0.35	0.28
7VUD93		54.10	-0.40	-0.19	44.60	-1.05	-0.84
8GRYUQ		55.70	1.20	0.58	43.50	-2.15	-1.72
8JC4V9		51.76	-2.74	-1.33	45.22	-0.43	-0.34
8MJ7DY		56.56	2.06	1.00	46.01	0.36	0.29
8TNXNH		55.05	0.55	0.27	43.50	-2.15	-1.72
9D43KQ		55.94	1.45	0.70	46.43	0.77	0.62
9K2RTU		54.70	0.20	0.10	43.80	-1.85	-1.48
9L47TA		57.15	2.65	1.28	44.38	-1.27	-1.01
9LYU8Y		50.90	-3.60	-1.74	45.60	-0.05	-0.04
A62FPH		52.50	-2.00	-0.97	45.90	0.25	0.20
A8PMDL	*	60.80	6.30	3.05	45.26	-0.39	-0.31
BKAN9J		51.47	-3.03	-1.47	46.57	0.92	0.73
BPRL4Z		56.23	1.74	0.84	46.54	0.89	0.71
BQM77R	X	76.00	21.50	10.42	58.45	12.80	10.20
BRJKTK		54.10	-0.40	-0.19	44.96	-0.69	-0.55
BUKP4K	M	No Data Reported			44.30	-1.35	-1.08
C2MCG7		54.70	0.20	0.10	45.90	0.25	0.20
CE8RK6		52.30	-2.20	-1.06	46.00	0.35	0.28
CEPWMB		54.09	-0.41	-0.20	43.74	-1.91	-1.52
CJZA3		54.37	-0.13	-0.06	46.59	0.94	0.75
CRDPKY		56.00	1.50	0.73	44.90	-0.75	-0.60
DE4DNV		53.60	-0.90	-0.43	45.90	0.25	0.20
DFXA2W	X	62.67	8.17	3.96	46.51	0.86	0.68
DJA9AQ		52.24	-2.26	-1.09	45.71	0.06	0.05



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 131

Yield Strength: Lab-Machined Flat Steel ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
DJY8LX		53.80	-0.70	-0.34	45.30	-0.35	-0.28
DYBQEX		54.80	0.30	0.15	44.50	-1.15	-0.92
DYUK3E		53.40	-1.10	-0.53	45.10	-0.55	-0.44
E8FCGH		55.00	0.50	0.24	44.90	-0.75	-0.60
E8G3R7	X	59.55	5.05	2.45	48.20	2.55	2.03
EK4CCQ		54.10	-0.40	-0.19	45.69	0.03	0.03
ELXYY3		54.60	0.10	0.05	46.10	0.45	0.36
EQR3WZ		57.18	2.68	1.30	45.01	-0.64	-0.51
F3LT26		51.80	-2.70	-1.31	47.60	1.95	1.55
F98NX3	M	No Data Reported			45.50	-0.15	-0.12
FJRUXR		54.00	-0.50	-0.24	44.00	-1.65	-1.32
G89XWT		57.10	2.60	1.26	46.05	0.40	0.32
GFAW3A		53.19	-1.31	-0.63	45.73	0.08	0.06
H9U8GD		54.48	-0.02	-0.01	45.42	-0.23	-0.18
HJKHDT		56.74	2.24	1.09	46.11	0.46	0.36
HXDFVP		56.28	1.78	0.86	45.98	0.32	0.26
J3KB7C		54.60	0.10	0.05	47.30	1.65	1.31
JCZQDE	X	81.10	26.60	12.89	44.00	-1.65	-1.32
JNC24P		55.40	0.90	0.44	44.30	-1.35	-1.08
JVMGE7		54.90	0.40	0.20	46.80	1.15	0.91
JWWLRU		52.80	-1.70	-0.82	44.90	-0.75	-0.60
JYF83X		56.46	1.97	0.95	46.50	0.85	0.67
JYQ7W7		54.82	0.33	0.16	44.31	-1.34	-1.07
K9DGXL		54.00	-0.50	-0.24	44.70	-0.95	-0.76
KMFV9G		51.10	-3.40	-1.65	45.50	-0.15	-0.12
KZ8HGX		50.50	-4.00	-1.94	45.97	0.32	0.25
L6PCPE		51.17	-3.33	-1.61	45.44	-0.21	-0.17
LNEW3K	X	56.50	2.00	0.97	49.80	4.15	3.30
LNMTVW		55.96	1.46	0.71	43.66	-2.00	-1.59
LV646R		54.50	0.00	0.00	47.30	1.65	1.31
MKKZCY	X	52.00	-2.50	-1.21	40.00	-5.65	-4.51
MTP9RY		57.60	3.10	1.50	45.10	-0.55	-0.44
NU28QD		56.23	1.74	0.84	47.39	1.74	1.39
P6YMTN		55.30	0.80	0.39	45.59	-0.06	-0.05
P7CW4A		55.50	1.00	0.49	44.50	-1.15	-0.92
PE4KTK		59.00	4.50	2.18	46.10	0.45	0.36
PEMHPH		53.50	-1.00	-0.48	44.50	-1.15	-0.92
QFXF4Z		59.00	4.50	2.18	44.50	-1.15	-0.92
QGQD8Z		52.07	-2.43	-1.18	45.11	-0.55	-0.44
QH2FTY		51.30	-3.20	-1.55	46.20	0.55	0.44
QHNW2E		55.72	1.22	0.59	46.62	0.97	0.77
QJ8WVB		54.80	0.30	0.15	42.90	-2.75	-2.19
QK4HGE		50.90	-3.60	-1.74	47.40	1.75	1.39
QK8WCN		52.00	-2.50	-1.21	46.00	0.35	0.28
R2TR9B		54.90	0.40	0.20	45.00	-0.65	-0.52
R69B6Y		52.40	-2.10	-1.02	43.70	-1.95	-1.56
RGPVQG		53.90	-0.60	-0.29	46.10	0.45	0.36



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 131

Yield Strength: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
RPCZG3		52.30	-2.20	-1.06	46.20	0.55	0.44
RTRPKC	M	No Data Reported			51.30	5.65	4.50
TDKUYH		55.60	1.10	0.53	46.50	0.85	0.67
TNNVPA		53.90	-0.60	-0.29	46.00	0.35	0.28
UZ626G	X	54.10	-0.40	-0.19	53.20	7.55	6.01
UZAR2R		56.20	1.70	0.83	43.60	-2.05	-1.64
V3MU7A		57.31	2.82	1.36	46.56	0.91	0.72
VQTEG9		54.08	-0.42	-0.20	43.64	-2.01	-1.60
VTJP92		55.55	1.05	0.51	45.73	0.08	0.06
W73VTT	X	56.00	1.50	0.73	52.00	6.35	5.06
W8VLY8		51.00	-3.50	-1.69	46.70	1.05	0.83
WYGW72	M	No Data Reported			48.20	2.55	2.03
X8GG6F		57.80	3.30	1.60	46.00	0.35	0.28
XHZ2E6	*	54.58	0.08	0.04	49.50	3.85	3.07
XV3K3X		52.30	-2.20	-1.06	43.80	-1.85	-1.48
YBCJV2		51.00	-3.50	-1.69	45.60	-0.05	-0.04
YWF6V8		53.10	-1.40	-0.68	46.90	1.25	0.99
Z6LLJJ		55.80	1.30	0.63	45.80	0.15	0.12
ZMYBDH		56.90	2.40	1.16	43.83	-1.82	-1.45
ZYUE2B		54.82	0.32	0.16	47.48	1.83	1.46

Summary Statistics

	Sample F63		Sample F64	
Grand Means	54.50	ksi	45.65	ksi
Stnd Dev Btwn Labs	2.06	ksi	1.25	ksi

Samples F63, F64 : AISI 4130 - 12G, AISI 4130 - 14G

Statistics based on 101 of 114 reporting participants



Comments on Assigned Data Flags for Test #131

- 29PYEU (X) - Data for sample F64 are low.
- BQM77R (X) - Data for both samples are high.
- BUKP4K (M) - Participant did not submit data for sample F63.
- DFXA2W (X) - Data for sample F63 are high.
- E8G3R7 (X) - Inconsistent in testing between samples.
- F98NX3 (M) - Participant did not submit data for sample F63.
- JCZQDE (X) - Data for sample F63 are very high.
- LNEW3K (X) - Data for sample F64 are high.
- MKKZCY (X) - Data for sample F64 are low.
- RTRPKC (M) - Participant did not submit data for sample F63.
- UZ626G (X) - Data for sample F64 are high.
- W73VTT (X) - Data for sample F64 are high.
- WYGW72 (M) - Participant did not submit data for sample F63.



Analysis 131

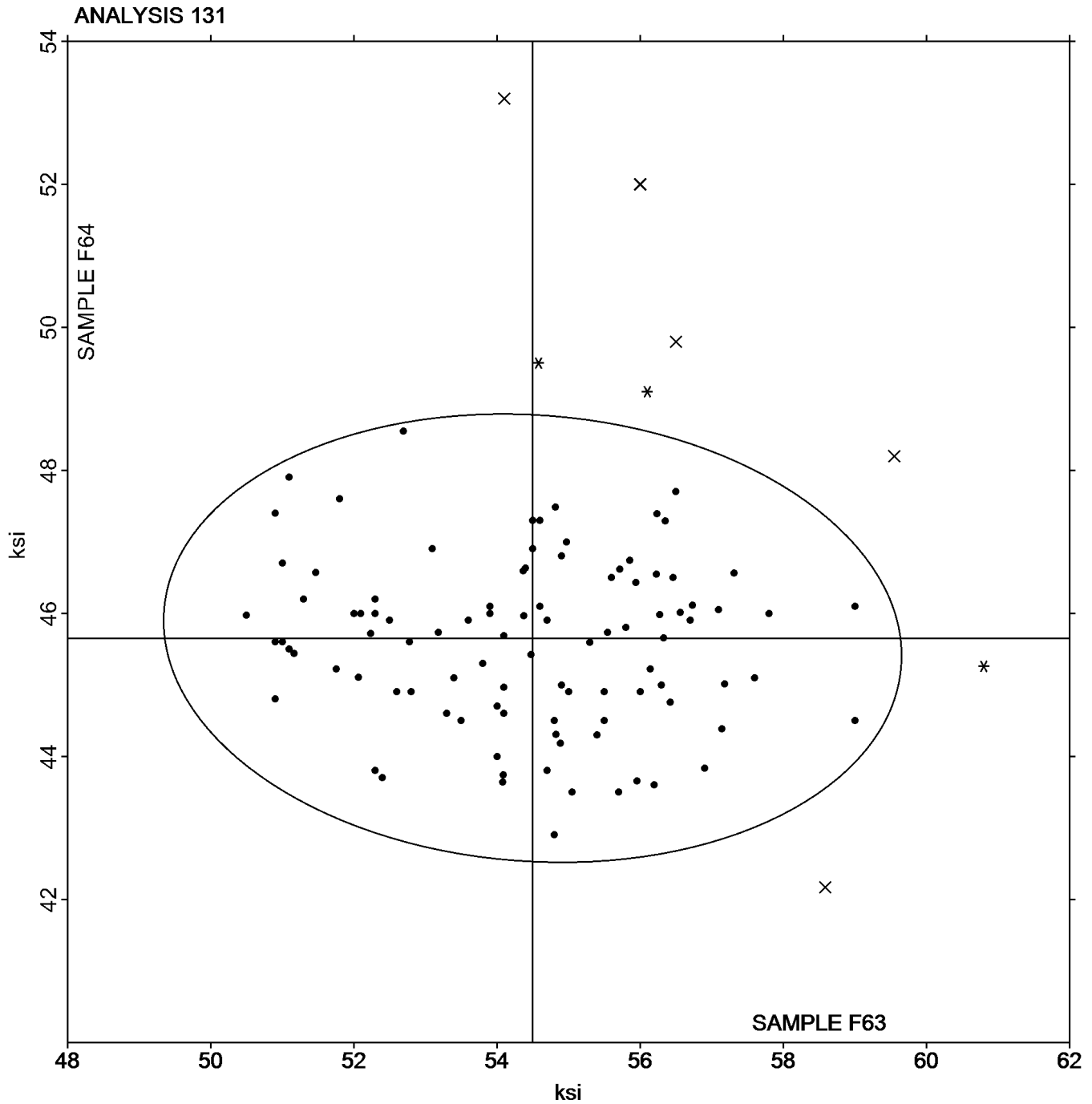
Yield Strength: Lab-Machined Flat Steel
ASTM E8

SAMPLE F63

54.50 ksi

SAMPLE F64

45.65 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 132

Elongation: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
29PYEU	*	30.75	2.33	1.47	26.50	-0.67	-0.35
2CHKU6		28.40	-0.02	-0.02	26.50	-0.67	-0.35
2E7EB7		27.40	-1.02	-0.65	26.90	-0.27	-0.14
32K3WB		28.80	0.38	0.24	29.40	2.23	1.18
34M6FL		30.00	1.58	1.00	30.00	2.83	1.49
37JRW3		28.00	-0.42	-0.27	25.00	-2.17	-1.14
42BPLK		31.00	2.58	1.63	29.00	1.83	0.97
47K6V9		30.36	1.94	1.22	30.80	3.63	1.92
496ZE3		28.60	0.18	0.11	25.00	-2.17	-1.14
4MBV6J		28.88	0.46	0.29	25.98	-1.19	-0.63
4PKVDW	*	24.10	-4.32	-2.73	23.40	-3.77	-1.99
4R33MR		30.00	1.58	1.00	29.00	1.83	0.97
4V44UG		26.80	-1.62	-1.03	25.40	-1.77	-0.93
62NHXE		27.40	-1.02	-0.65	23.60	-3.57	-1.88
632BRF		27.00	-1.42	-0.90	25.70	-1.47	-0.77
6DFC4F		25.00	-3.42	-2.16	24.50	-2.67	-1.41
6TNGY8		28.60	0.18	0.11	24.40	-2.77	-1.46
6U6FQC		28.10	-0.32	-0.20	26.20	-0.97	-0.51
7BJAK6		28.00	-0.42	-0.27	26.00	-1.17	-0.62
7GBG3D		30.38	1.96	1.24	30.07	2.90	1.53
7NA6TH		26.20	-2.22	-1.41	22.90	-4.27	-2.25
7QXHJN		29.72	1.30	0.82	29.50	2.33	1.23
7UXRL3		28.60	0.18	0.11	26.00	-1.17	-0.62
7VUD93		29.80	1.38	0.87	29.90	2.73	1.44
8GRYUQ		27.60	-0.82	-0.52	25.70	-1.47	-0.77
8JC4V9		28.10	-0.32	-0.20	26.80	-0.37	-0.19
8MJ7DY		27.50	-0.92	-0.58	27.00	-0.17	-0.09
8TNXNH	*	27.80	-0.62	-0.39	30.10	2.93	1.55
9D43KQ		28.20	-0.22	-0.14	26.80	-0.37	-0.19
9K2RTU		25.70	-2.72	-1.72	25.60	-1.57	-0.83
9L47TA		28.80	0.38	0.24	27.90	0.73	0.39
9LYU8Y		28.60	0.18	0.11	27.50	0.33	0.18
A62FPH		27.40	-1.02	-0.65	24.70	-2.47	-1.30
A8PMDL		26.70	-1.72	-1.09	24.50	-2.67	-1.41
BKAN9J	X	32.50	4.08	2.58	25.83	-1.34	-0.71
BPRL4Z		27.10	-1.32	-0.84	26.20	-0.97	-0.51
BRJKTK	X	31.30	2.88	1.82	25.80	-1.37	-0.72
BUKP4K	M	No Data Reported			29.30	2.13	1.13
C2MCG7		25.50	-2.92	-1.85	25.00	-2.17	-1.14
CE8RK6		25.50	-2.92	-1.85	24.90	-2.27	-1.20
CEPWMB		27.62	-0.80	-0.51	27.60	0.43	0.23
CJZA3		28.22	-0.20	-0.13	26.78	-0.39	-0.20
CRDPKY		29.10	0.68	0.43	28.60	1.43	0.76
DE4DNV		26.60	-1.82	-1.15	24.20	-2.97	-1.57
DFXA2W		29.00	0.58	0.36	26.00	-1.17	-0.62
DJA9AQ		26.58	-1.84	-1.17	25.45	-1.72	-0.91
DJY8LX		28.00	-0.42	-0.27	27.00	-0.17	-0.09



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 132

Elongation: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
DYBQEX		29.80	1.38	0.87	29.80	2.63	1.39
DYUK3E		28.90	0.48	0.30	26.60	-0.57	-0.30
E8FCGH		29.00	0.58	0.36	28.00	0.83	0.44
E8G3R7	X	24.57	-3.85	-2.44	26.78	-0.39	-0.20
EK4CCQ		28.90	0.48	0.30	27.40	0.23	0.12
ELXXY3		29.00	0.58	0.36	28.70	1.53	0.81
EQR3WZ		28.00	-0.42	-0.27	27.60	0.43	0.23
F3LT26		27.20	-1.22	-0.77	25.60	-1.57	-0.83
F98NX3	M	No Data Reported			26.40	-0.77	-0.41
FJRUXR		28.00	-0.42	-0.27	28.00	0.83	0.44
G89XWT	*	23.90	-4.52	-2.86	22.70	-4.47	-2.36
GFAW3A		28.70	0.28	0.17	24.60	-2.57	-1.36
H9U8GD	*	32.80	4.38	2.77	32.30	5.13	2.71
HJKHDT		28.50	0.08	0.05	29.10	1.93	1.02
HXDFVP		27.88	-0.54	-0.34	28.01	0.84	0.44
J3KB7C		30.00	1.58	1.00	27.00	-0.17	-0.09
JCZQDE		30.50	2.08	1.31	29.00	1.83	0.97
JNC24P		29.40	0.98	0.62	26.00	-1.17	-0.62
JVMGE7		27.80	-0.62	-0.39	28.40	1.23	0.65
JWWLRU		29.50	1.08	0.68	27.00	-0.17	-0.09
JYF83X		29.07	0.65	0.41	28.01	0.84	0.44
JYQ7W7		27.00	-1.42	-0.90	24.30	-2.87	-1.51
K9DGXL		29.50	1.08	0.68	27.00	-0.17	-0.09
KMFV9G		27.70	-0.72	-0.46	27.00	-0.17	-0.09
KZ8HGX		28.38	-0.04	-0.03	27.55	0.38	0.20
L6PCPE		29.50	1.08	0.68	27.90	0.73	0.39
LNEW3K		26.25	-2.17	-1.37	27.75	0.58	0.31
LNMTVW		30.30	1.88	1.19	30.30	3.13	1.65
LV646R		30.20	1.78	1.12	29.40	2.23	1.18
MKKZCY		29.30	0.88	0.55	26.40	-0.77	-0.41
MTP9RY		28.90	0.48	0.30	26.60	-0.57	-0.30
NU28QD		28.00	-0.42	-0.27	27.50	0.33	0.18
P6YMTN		28.00	-0.42	-0.27	27.00	-0.17	-0.09
P7CW4A	M	23.50	-4.92	-3.11	No Data Reported		
PE4KTK		30.00	1.58	1.00	26.70	-0.47	-0.25
PEMHPH		28.30	-0.12	-0.08	27.50	0.33	0.18
QFXF4Z		32.00	3.58	2.26	30.00	2.83	1.49
QGQD8Z		30.20	1.78	1.12	30.60	3.43	1.81
QH2FTY		28.90	0.48	0.30	27.40	0.23	0.12
QHNW2E		29.00	0.58	0.36	29.60	2.43	1.28
QJ8WVB		28.00	-0.42	-0.27	26.50	-0.67	-0.35
QK4HGE		31.50	3.08	1.94	29.20	2.03	1.07
QK8WCN		27.60	-0.82	-0.52	27.00	-0.17	-0.09
R2TR9B		27.50	-0.92	-0.58	26.80	-0.37	-0.19
R69B6Y		28.00	-0.42	-0.27	26.00	-1.17	-0.62
RGPVQG		29.00	0.58	0.36	28.50	1.33	0.70
RPCZG3		30.00	1.58	1.00	28.00	0.83	0.44



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 132

Elongation: Lab-Machined Flat Steel
ASTM E8

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
RTRPKC	M	No Data Reported			25.00	-2.17	-1.14
TDKUYH		29.60	1.18	0.74	28.60	1.43	0.76
TNNVPA		29.10	0.68	0.43	28.10	0.93	0.49
UZ626G		28.30	-0.12	-0.08	28.60	1.43	0.76
UZAR2R		31.50	3.08	1.94	29.50	2.33	1.23
V3MU7A		25.63	-2.79	-1.77	25.73	-1.44	-0.76
VQTEG9		28.30	-0.12	-0.08	27.50	0.33	0.18
VTJP92	X	25.20	-3.22	-2.04	30.10	2.93	1.55
W73VTT		28.80	0.38	0.24	27.30	0.13	0.07
W8VLY8		30.90	2.48	1.56	28.70	1.53	0.81
WYGW72	M	No Data Reported			25.00	-2.17	-1.14
X8GG6F		26.10	-2.32	-1.47	26.60	-0.57	-0.30
XHZ2E6		27.45	-0.97	-0.62	24.55	-2.62	-1.38
XV3K3X		30.30	1.88	1.19	30.50	3.33	1.76
YBCJV2		27.00	-1.42	-0.90	26.00	-1.17	-0.62
YE8FZU		29.16	0.74	0.47	28.33	1.16	0.61
YWF6V8		27.70	-0.72	-0.46	26.10	-1.07	-0.56
Z6LLJJ		29.20	0.78	0.49	29.10	1.93	1.02
ZA7RWR	X	29.16	0.74	0.47	21.67	-5.50	-2.90
ZHZWPT	X	31.45	3.03	1.91	21.88	-5.29	-2.79
ZMYBDH		27.30	-1.12	-0.71	26.17	-1.00	-0.53
ZYUE2B		26.80	-1.62	-1.03	24.90	-2.27	-1.20

Summary Statistics

	Sample F63		Sample F64	
Grand Means	28.42	Percent	27.17	Percent
Std Dev Btwn Labs	1.58	Percent	1.89	Percent

Samples F63, F64 : AISI 4130 - 12G, AISI 4130 - 14G

Statistics based on 105 of 116 reporting participants

Comments on Assigned Data Flags for Test #132

- BKAN9J (X) - Inconsistent in testing between samples.
- BRJKTK (X) - Inconsistent in testing between samples.
- BUKP4K (M) - Participant did not submit data for sample F63.
- E8G3R7 (X) - Inconsistent in testing between samples.
- F98NX3 (M) - Participant did not submit data for sample F63.
- P7CW4A (M) - Participant did not submit data for sample F64.
- RTRPKC (M) - Participant did not submit data for sample F63.
- VTJP92 (X) - Inconsistent in testing between samples.
- WYGW72 (M) - Participant did not submit data for sample F63.
- ZA7RWR (X) - Data for sample F64 are low.
- ZHZWPT (X) - Data for sample F64 are low.

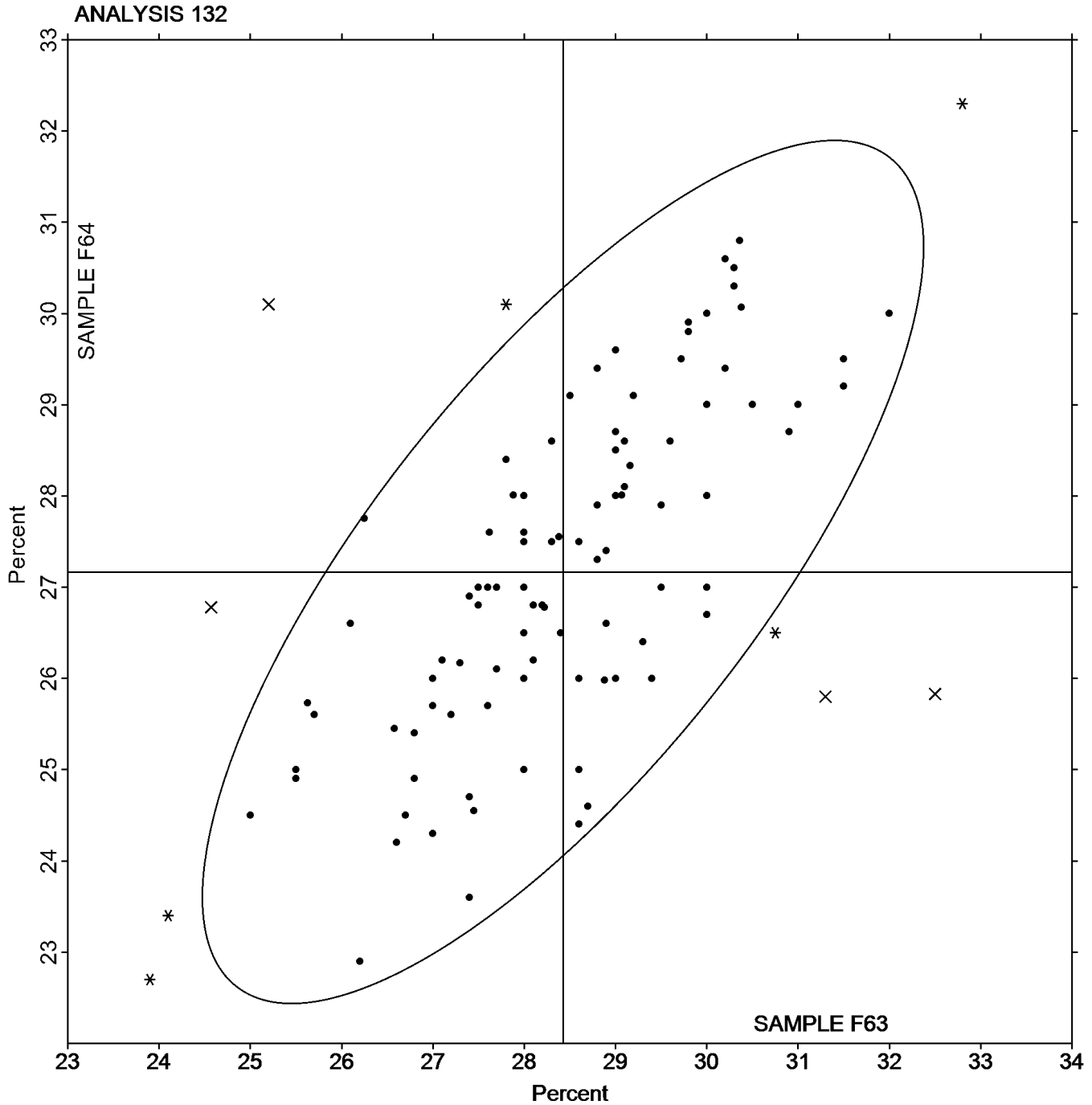


Analysis 132

Elongation: Lab-Machined Flat Steel
ASTM E8

SAMPLE F63
28.42 Percent

SAMPLE F64
27.17 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 133

r-Value: Lab-Machined Flat Steel
ASTM E517

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
6TNGY8		0.8000	0.0586	1.11	0.9600	0.1440	1.53
7BJAK6		0.7610	0.0196	0.37	0.8230	0.0070	0.07
7UXRL3		0.6720	-0.0694	-1.31	0.7290	-0.0870	-0.92
7VUD93		0.7500	0.0086	0.16	0.9400	0.1240	1.32
8JC4V9		0.7953	0.0539	1.02	0.9511	0.1352	1.43
BRJKTK		0.6680	-0.0734	-1.39	0.6690	-0.1470	-1.56
CE8RK6		0.7270	-0.0144	-0.27	0.7820	-0.0340	-0.36
DFXA2W		0.6840	-0.0574	-1.09	0.8340	0.0180	0.19
DJY8LX		0.7440	0.0026	0.05	0.8940	0.0780	0.83
DYUK3E		0.6720	-0.0694	-1.31	0.6180	-0.1980	-2.10
E8FCGH	X	1.057	0.3154	5.98	1.112	0.2962	3.14
ELXY3		0.7700	0.0286	0.54	0.9120	0.0960	1.02
F98NX3	M	No Data Reported			0.7700	-0.0460	-0.49
GFAW3A		0.6980	-0.0434	-0.82	0.7640	-0.0520	-0.55
HJKHDT		0.8010	0.0596	1.13	0.9270	0.1110	1.18
LNMTVW		0.8100	0.0686	1.30	0.7700	-0.0460	-0.49
LV646R		0.7300	-0.0114	-0.22	0.8600	0.0440	0.47
PE4KTK		0.7500	0.0086	0.16	0.8700	0.0540	0.57
QHNW2E		0.6600	-0.0814	-1.54	0.7300	-0.0860	-0.91
RTRPKC	M	No Data Reported			0.5020	-0.3140	-3.33
TNNVPA		0.7700	0.0286	0.54	0.7900	-0.0260	-0.28
V3MU7A		0.7500	0.0086	0.16	0.7300	-0.0860	-0.91
VQTEG9	*	0.8580	0.1166	2.21	0.8080	-0.0080	-0.08
VTJP92		0.7200	-0.0214	-0.40	0.8600	0.0440	0.47
W8VLY8		0.7200	-0.0214	-0.40	0.7300	-0.0860	-0.91

Summary Statistics

	Sample F63	Sample F64
Grand Means	0.7414	0.8160
Stnd Dev Btrwn Labs	0.0528	0.0942

Samples F63, F64 : AISI 4130 - 12G, AISI 4130 - 14G

Statistics based on 22 of 25 reporting participants

Comments on Assigned Data Flags for Test #133

- E8FCGH (X) - Data for both samples are high.
- F98NX3 (M) - Participant did not submit data for sample F63.
- RTRPKC (M) - Participant did not submit data for sample F63.



Analysis 133

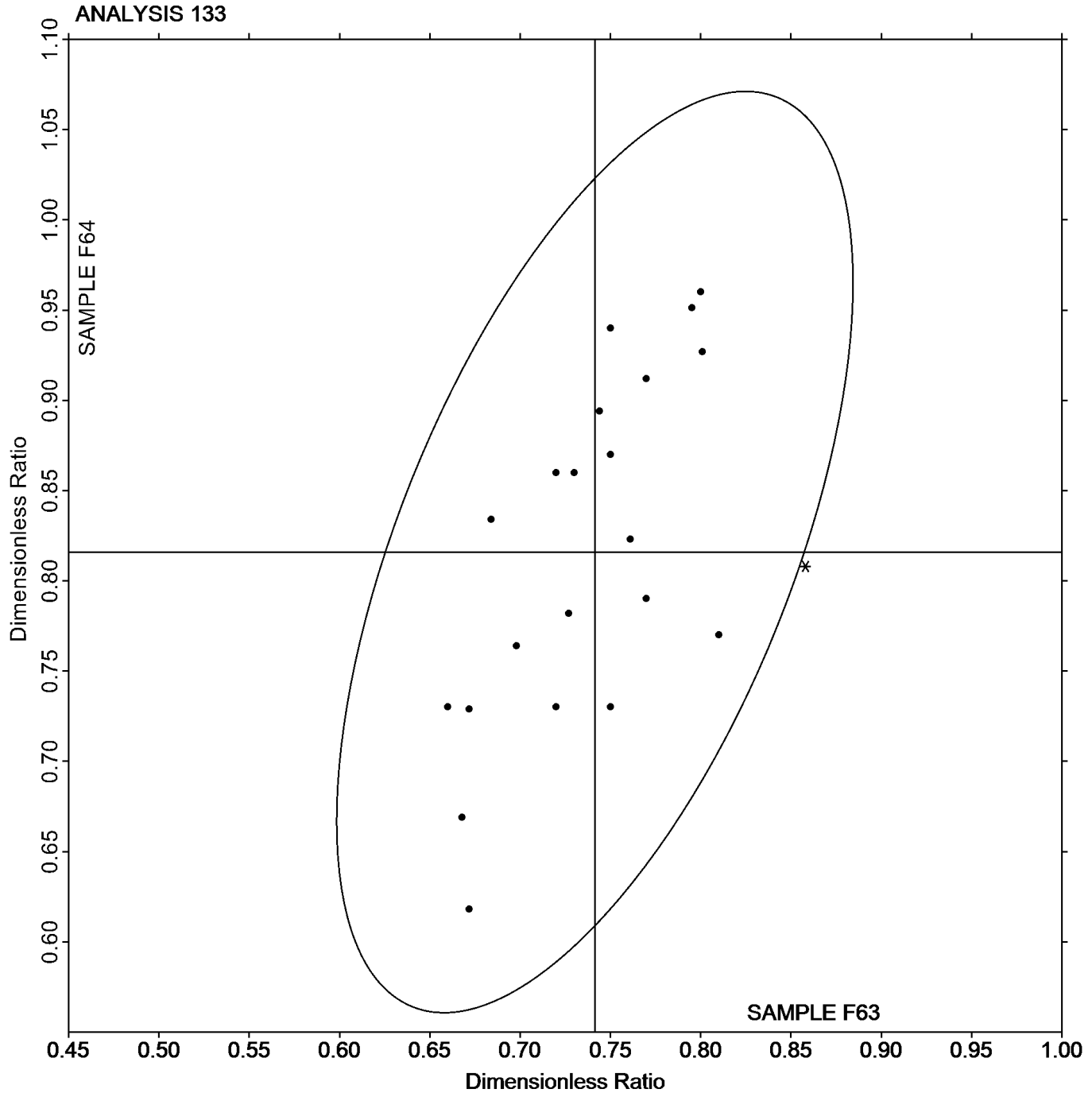
r-Value: Lab-Machined Flat Steel
ASTM E517

SAMPLE F63

SAMPLE F64

0.7414

0.8160





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 134

n-Value: Lab-Machined Flat Steel
ASTM E646

WebCode	Data Flag	Sample F63			Sample F64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
2CHKU6		0.1710	0.0009	0.05	0.1560	0.0012	0.07
2E7EB7		0.1700	-0.0001	-0.01	0.1500	-0.0048	-0.25
4PKVDW		0.1420	-0.0281	-1.48	0.1270	-0.0278	-1.47
62NHXE		0.1340	-0.0361	-1.90	0.1140	-0.0408	-2.16
632BRF		0.1700	-0.0001	-0.01	0.1570	0.0022	0.12
6TNGY8		0.1800	0.0099	0.52	0.1700	0.0152	0.81
7BJAK6	X	0.2460	0.0759	3.99	0.2490	0.0942	5.00
7NA6TH		0.1400	-0.0301	-1.59	0.1300	-0.0248	-1.31
7UXRL3		0.1870	0.0169	0.89	0.1580	0.0032	0.17
7VUD93		0.1650	-0.0051	-0.27	0.1530	-0.0018	-0.09
8GRYUQ		0.1922	0.0221	1.16	0.1796	0.0248	1.32
8JC4V9	M	0.1884	0.0183	0.96	No Data Reported		
9LYU8Y		0.1563	-0.0138	-0.73	0.1289	-0.0259	-1.37
BPRL4Z	X	0.3440	0.1739	9.15	0.2760	0.1212	6.43
BRJKTK		0.1600	-0.0101	-0.53	0.1500	-0.0048	-0.25
CE8RK6		0.1610	-0.0091	-0.48	0.1440	-0.0108	-0.57
CJZA3	*	0.2190	0.0489	2.57	0.1930	0.0382	2.03
DFXA2W		0.1760	0.0059	0.31	0.1620	0.0072	0.38
DJY8LX		0.1610	-0.0091	-0.48	0.1450	-0.0098	-0.52
DYUK3E		0.1490	-0.0211	-1.11	0.1410	-0.0138	-0.73
E8FCGH		0.1959	0.0258	1.36	0.1930	0.0382	2.03
ELXY3		0.1550	-0.0151	-0.80	0.1380	-0.0168	-0.89
EQR3WZ		0.1631	-0.0070	-0.37	0.1570	0.0022	0.12
F3LT26		0.1820	0.0119	0.63	0.1530	-0.0018	-0.09
F98NX3	M	No Data Reported			0.1420	-0.0128	-0.68
GFAW3A		0.1940	0.0239	1.26	0.1590	0.0042	0.23
HJKHDT		0.1720	0.0019	0.10	0.1620	0.0072	0.38
JVMGE7		0.1730	0.0029	0.15	0.1600	0.0052	0.28
JYF83X		0.1550	-0.0151	-0.80	0.1450	-0.0098	-0.52
LNMTVW		0.1600	-0.0101	-0.53	0.1530	-0.0018	-0.09
LV646R	*	0.1870	0.0169	0.89	0.1490	-0.0058	-0.31
PE4KTK		0.1520	-0.0181	-0.95	0.1470	-0.0078	-0.41
QHNW2E		0.1850	0.0149	0.78	0.1840	0.0292	1.55
QK4HGE		0.1649	-0.0052	-0.27	0.1459	-0.0089	-0.47
RTRPKC	M	No Data Reported			0.5020	0.3472	18.41
TNNVPA		0.1500	-0.0201	-1.06	0.1380	-0.0168	-0.89
UZAR2R		0.1700	-0.0001	-0.01	0.1640	0.0092	0.49
V3MU7A		0.1530	-0.0171	-0.90	0.1390	-0.0158	-0.84
VQTEG9		0.2060	0.0359	1.89	0.1930	0.0382	2.03
VTJP92		0.1990	0.0289	1.52	0.1870	0.0322	1.71
W8VLY8		0.1660	-0.0041	-0.22	0.1420	-0.0128	-0.68
XHZ2E6		0.1781	0.0080	0.42	0.1585	0.0038	0.20



Analysis 134

n-Value: Lab-Machined Flat Steel
ASTM E646

Summary Statistics

	<u>Sample F63</u>	<u>Sample F64</u>
Grand Means	0.1701	0.1548
Std Dev Btwn Labs	0.0190	0.0189

Samples F63, F64 : AISI 4130 - 12G, AISI 4130 - 14G

Statistics based on 37 of 42 reporting participants

Comments on Assigned Data Flags for Test #134

- 7BJAK6 (X) - Data for both samples are high. Possible Systematic Error.
- 8JC4V9 (M) - Participant did not submit data for sample F64.
- BPRL4Z (X) - Data for both samples are high. Possible Systematic Error.
- F98NX3 (M) - Participant did not submit data for sample F63.
- RTRPKC (M) - Participant did not submit data for sample F63.



Analysis 134

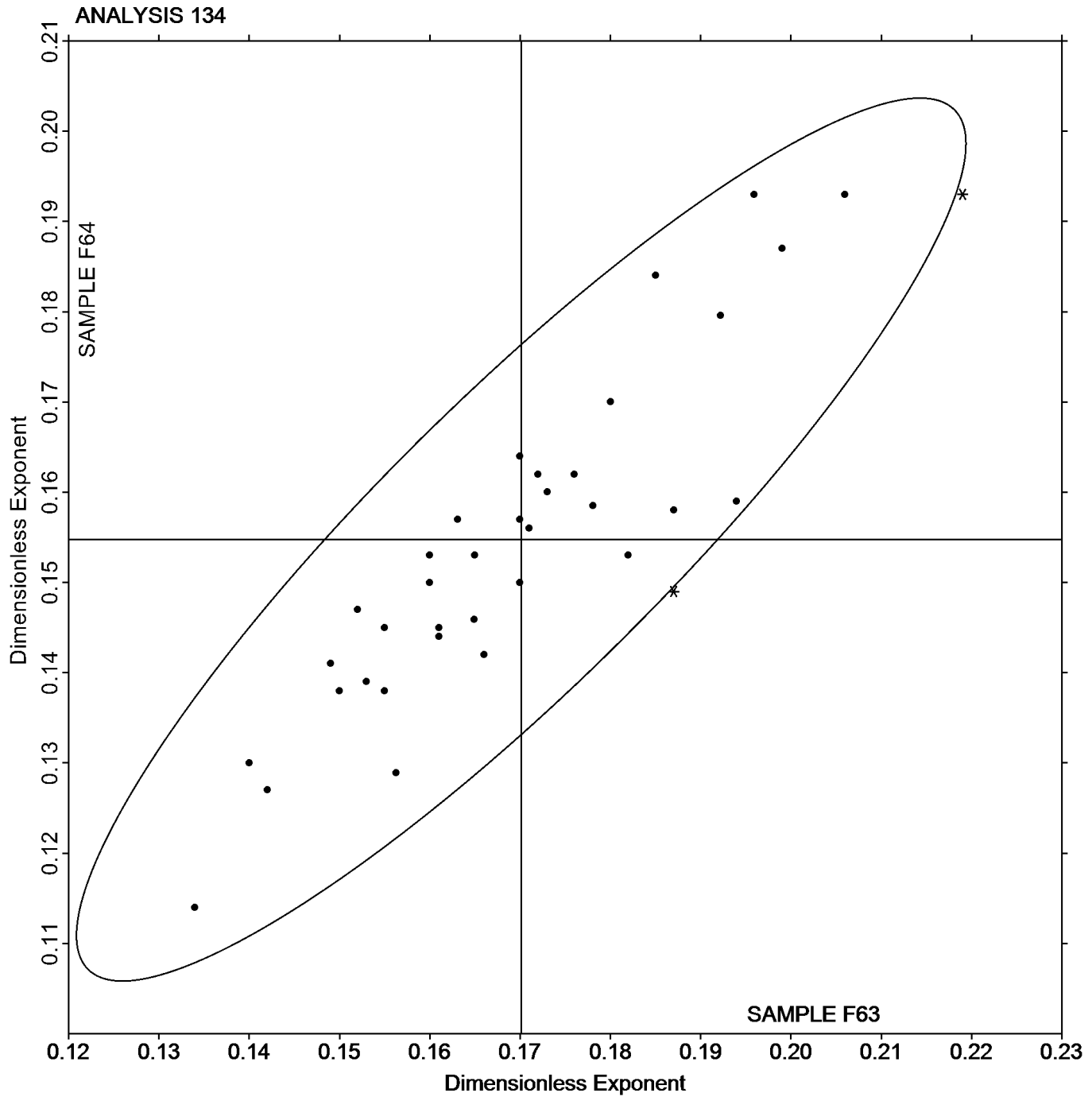
n-Value: Lab-Machined Flat Steel
ASTM E646

SAMPLE F63

0.1701

SAMPLE F64

0.1548





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 136

Rockwell Superficial Hardness (30N Scale)
ASTM E18

WebCode	Data Flag	Sample E63			Sample E64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
38M9CE		77.92	-0.32	-0.65	73.82	-0.64	-1.33
3HHJHZ		78.48	0.24	0.49	74.82	0.36	0.74
4UB6LA		78.56	0.32	0.66	74.92	0.46	0.95
4V44UG		79.02	0.78	1.59	74.40	-0.06	-0.13
6AY6JM	X	73.62	-4.62	-9.39	77.88	3.42	7.09
6DFC4F		78.08	-0.16	-0.32	73.96	-0.50	-1.04
87DXJQ		78.12	-0.12	-0.24	73.74	-0.72	-1.50
8CEDM6	*	77.00	-1.24	-2.52	73.96	-0.50	-1.04
8GRYUQ		78.44	0.20	0.41	74.46	0.00	0.00
8LQ99Y		78.68	0.44	0.90	75.00	0.54	1.12
AJRW7V	*	78.44	0.20	0.41	75.52	1.06	2.20
B8NCX9		77.88	-0.36	-0.73	73.96	-0.50	-1.04
CRFEVM		78.88	0.64	1.31	75.08	0.62	1.28
D3WJFR		77.34	-0.90	-1.82	73.24	-1.22	-2.53
D9V9FJ	X	74.60	-3.64	-7.39	77.96	3.50	7.26
E3AJRT	*	76.70	-1.54	-3.13	73.56	-0.90	-1.87
E4HV89		77.84	-0.40	-0.81	74.16	-0.30	-0.63
EPH4QX		78.68	0.44	0.90	74.46	0.00	0.00
F9C3B4		78.46	0.22	0.45	74.72	0.26	0.54
FVGTTP		78.56	0.32	0.65	74.79	0.33	0.68
G89XWT		78.88	0.64	1.31	74.68	0.22	0.46
H66ANH		78.12	-0.12	-0.24	74.58	0.12	0.25
HWTAU8		77.86	-0.38	-0.77	74.08	-0.38	-0.79
JWWLRU		78.66	0.42	0.86	74.64	0.18	0.37
K8M78T		78.70	0.46	0.94	74.94	0.48	0.99
KQCNWK		78.14	-0.10	-0.20	74.88	0.42	0.87
L8WPBM		78.38	0.14	0.29	74.66	0.20	0.41
LEFZHW		78.40	0.16	0.33	74.32	-0.14	-0.29
LNMTVW		78.00	-0.24	-0.48	74.00	-0.46	-0.96
MJR49X		78.32	0.08	0.17	74.52	0.06	0.12
MMPNVU		78.16	-0.08	-0.16	74.76	0.30	0.62
P8QE8F		78.20	-0.04	-0.08	73.90	-0.56	-1.16
P9CAHL		78.44	0.20	0.41	74.04	-0.42	-0.87
QFBEPW		78.04	-0.20	-0.40	73.96	-0.50	-1.04
QK8WCN		78.84	0.60	1.23	75.02	0.56	1.16
RQB48X		77.80	-0.44	-0.89	74.16	-0.30	-0.63
T8RQ9Y		78.60	0.36	0.74	75.24	0.78	1.61
TTMKMF		78.40	0.16	0.33	74.70	0.24	0.49
TZVQXD		78.20	-0.04	-0.08	74.70	0.24	0.49
UNEL4M		78.60	0.36	0.74	74.94	0.48	0.99
URBAH9	*	77.00	-1.24	-2.52	74.00	-0.46	-0.96
X8GG6F		78.14	-0.10	-0.20	74.48	0.02	0.04
YBCJV2		78.42	0.18	0.37	74.72	0.26	0.54
YK GK4F		78.30	0.06	0.13	74.10	-0.36	-0.75
YLYDB6		78.50	0.26	0.53	74.58	0.12	0.25
YMYQCB		78.40	0.16	0.33	74.60	0.14	0.29
ZMYBDH		78.10	-0.14	-0.28	75.00	0.54	1.12



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 136

Rockwell Superficial Hardness (30N Scale)
ASTM E18

Summary Statistics

	<u>Sample E63</u>		<u>Sample E64</u>	
Grand Means	78.24	HR30N	74.46	HR30N
Std Dev Btwn Labs	0.49	HR30N	0.48	HR30N

Samples E63, E64 : Steel, Steel

Statistics based on 45 of 47 reporting participants

Comments on Assigned Data Flags for Test #136

6AY6JM (X) - Data appear to be transposed between samples.

D9V9FJ (X) - Data appear to be transposed between samples.



Analysis 136

Rockwell Superficial Hardness (30N Scale)

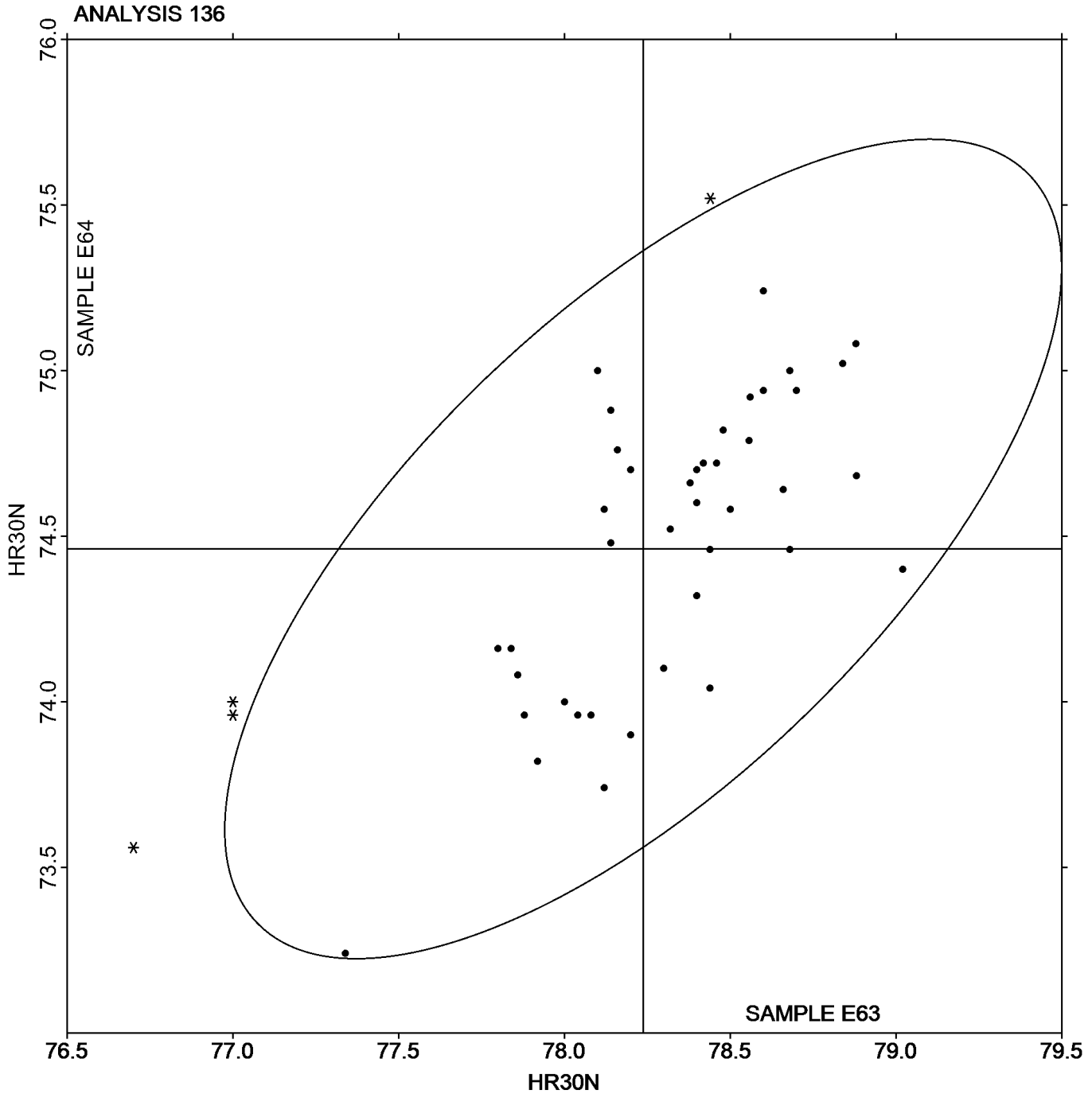
ASTM E18

SAMPLE E63

78.24 HR30N

SAMPLE E64

74.46 HR30N





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 145

Total Case Depth
SAE J423, SAE J78

WebCode	Data Flag	Sample C63			Sample C64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
2K9CWY		0.0234	-0.0021	-0.55	0.0321	0.0007	0.18
33JQJC	*	0.0182	-0.0073	-1.88	0.0218	-0.0096	-2.52
3GMXYG	*	0.0354	0.0099	2.54	0.0386	0.0072	1.88
4UB6LA		0.0278	0.0023	0.58	0.0325	0.0011	0.29
673EJ3		0.0214	-0.0041	-1.06	0.0314	0.0000	-0.01
68QWCN		0.0181	-0.0074	-1.91	0.0247	-0.0067	-1.75
6AY6JM		0.0300	0.0044	1.14	0.0343	0.0028	0.74
8GRYUQ		0.0249	-0.0006	-0.15	0.0272	-0.0042	-1.10
979VBX		0.0257	0.0002	0.04	0.0313	-0.0001	-0.03
AJRW7V		0.0244	-0.0011	-0.28	0.0272	-0.0043	-1.11
AV3J6U		0.0194	-0.0061	-1.57	0.0294	-0.0020	-0.53
BRJTKT		0.0255	0.0000	-0.01	0.0296	-0.0018	-0.47
CVAKYR		0.0242	-0.0013	-0.34	0.0310	-0.0005	-0.12
D2XHCL		0.0243	-0.0012	-0.30	0.0301	-0.0013	-0.34
D3WJFR		0.0274	0.0019	0.48	0.0303	-0.0012	-0.31
DJY8LX		0.0293	0.0038	0.98	0.0358	0.0044	1.15
E2W3CU		0.0285	0.0030	0.77	0.0350	0.0035	0.92
EPH4QX		0.0244	-0.0011	-0.29	0.0312	-0.0002	-0.06
FRL3HH		0.0223	-0.0032	-0.83	0.0278	-0.0036	-0.94
FTCBFZ		0.0269	0.0014	0.36	0.0311	-0.0003	-0.09
H6FDTU		0.0237	-0.0019	-0.48	0.0304	-0.0010	-0.26
H9U8GD		0.0271	0.0016	0.41	0.0349	0.0035	0.90
JHP78R	X	0.00246	-0.0231	-5.91	0.0304	-0.0010	-0.27
JLHCGM		0.0247	-0.0008	-0.20	0.0295	-0.0019	-0.50
JRWVVN		0.0337	0.0082	2.10	0.0396	0.0082	2.14
JWWLRU	M	0.0306	0.0051	1.30	No Data Reported		
K782D2	X	0.0289	0.0034	0.86	0.0275	-0.0039	-1.03
KMFV9G		0.0230	-0.0025	-0.65	0.0283	-0.0031	-0.81
KQCNWK		0.0290	0.0035	0.89	0.0340	0.0026	0.67
L64YPF		0.0244	-0.0011	-0.28	0.0310	-0.0004	-0.10
L734JG		0.0227	-0.0028	-0.73	0.0251	-0.0064	-1.66
L8QJQD		0.0196	-0.0059	-1.52	0.0282	-0.0032	-0.84
LD8LDB		0.0312	0.0057	1.46	0.0377	0.0062	1.63
LNMTVW	X	0.0308	0.0053	1.36	0.0452	0.0137	3.59
MMPNVU		0.0303	0.0048	1.23	0.0352	0.0038	0.99
NCWUZJ		0.0248	-0.0007	-0.18	0.0296	-0.0018	-0.48
NGYP3K		0.0244	-0.0011	-0.29	0.0304	-0.0010	-0.27
QFBEPW		0.0272	0.0017	0.43	0.0344	0.0030	0.78
QN7CG6		0.0307	0.0052	1.33	0.0375	0.0060	1.58
QRQYH6	X	0.0243	-0.0012	-0.30	0.0383	0.0069	1.80
R69B6Y		0.0192	-0.0063	-1.62	0.0250	-0.0065	-1.69
TLTGU4		0.0290	0.0035	0.89	0.0360	0.0046	1.20
TTMKMF		0.0206	-0.0049	-1.25	0.0257	-0.0057	-1.50
UZAR2R		0.0284	0.0029	0.75	0.0333	0.0018	0.48
VKXDH9		0.0250	-0.0005	-0.13	0.0336	0.0022	0.57
W8VLY8		0.0272	0.0017	0.43	0.0300	-0.0014	-0.36
WW24TE		0.0294	0.0039	1.00	0.0356	0.0042	1.09



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 145 Total Case Depth SAE J423, SAE J78

WebCode	Data Flag	Sample C63			Sample C64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
XUEYK9		0.0216	-0.0039	-1.00	0.0278	-0.0036	-0.95
XXRL8L		0.0234	-0.0021	-0.55	0.0300	-0.0014	-0.37
YBCJV2		0.0198	-0.0058	-1.48	0.0300	-0.0014	-0.36
YJR3AU		0.0271	0.0016	0.40	0.0345	0.0031	0.80
YK GK4F		0.0240	-0.0015	-0.39	0.0300	-0.0014	-0.37
YLYDB6		0.0284	0.0029	0.74	0.0329	0.0015	0.40
Z7FA2E		0.0250	-0.0005	-0.13	0.0330	0.0016	0.41
ZMYBDH		0.0296	0.0041	1.05	0.0356	0.0042	1.10

Summary Statistics

	Sample C63		Sample C64	
Grand Means	0.0255	inches	0.0314	inches
Stnd Dev Brwn Labs	0.0039	inches	0.0038	inches

Samples C63, C64 : Steel, Steel

Statistics based on 50 of 55 reporting participants

Comments on Assigned Data Flags for Test #145

- JHP78R (X) - Data for sample C63 are low.
- JWWLRU (M) - Participant did not submit data for sample C64.
- K782D2 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- LNMTVW (X) - Data for sample C64 are high. Inconsistent within the determinations of sample C64.
- QRQYH6 (X) - Inconsistent in testing between samples.

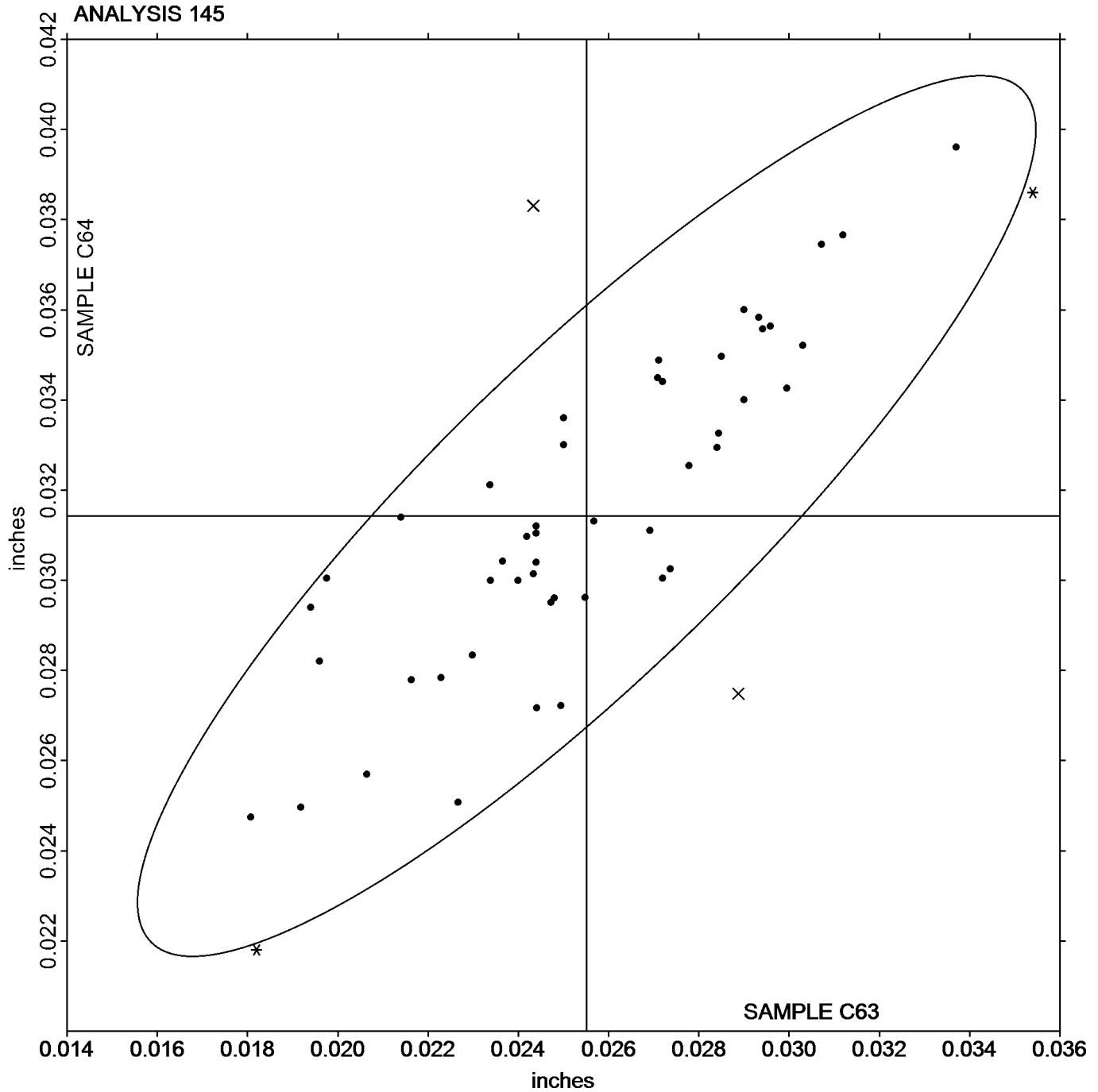


Analysis 145

Total Case Depth
SAE J423, SAE J78

SAMPLE C63
0.0255 inches

SAMPLE C64
0.0314 inches





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 146

Effective Case Depth
SAE J423, SAE J78

WebCode	Data Flag	Sample C63			Sample C64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
2K9CWY		0.0225	-0.0016	-1.09	0.0299	-0.0002	-0.11
34GYRV		0.0255	0.0015	1.00	0.0330	0.0029	1.85
3R4RXG		0.0242	0.0001	0.09	0.0322	0.0021	1.34
43LMXG		0.0250	0.0009	0.64	0.0310	0.0009	0.57
46A8GQ		0.0240	-0.0001	-0.05	0.0302	0.0001	0.05
4UB6LA	*	0.0233	-0.0008	-0.56	0.0263	-0.0038	-2.48
662M68		0.0242	0.0001	0.07	0.0306	0.0004	0.28
673EJ3		0.0252	0.0011	0.75	0.0316	0.0015	0.95
68QWCN		0.0243	0.0003	0.18	0.0314	0.0013	0.81
6AY6JM		0.0249	0.0008	0.55	0.0313	0.0012	0.76
8GRYUQ		0.0233	-0.0008	-0.53	0.0278	-0.0023	-1.50
979VBX		0.0265	0.0024	1.68	0.0313	0.0012	0.78
9JGMRC	X	0.0142	-0.0099	-6.80	0.0216	-0.0085	-5.50
AJRW7V		0.0251	0.0010	0.72	0.0310	0.0009	0.56
AV3J6U	X	0.0168	-0.0073	-5.01	0.0264	-0.0037	-2.40
BRJTK		0.0250	0.0010	0.66	0.0306	0.0005	0.30
CEAJCL	X	0.0247	0.0006	0.45	0.0346	0.0045	2.87
CGC9T9		0.0246	0.0005	0.36	0.0300	-0.0001	-0.06
CKYVD9		0.0266	0.0025	1.75	0.0320	0.0019	1.25
CVAKYR		0.0256	0.0015	1.04	0.0312	0.0011	0.69
D3WJFR		0.0234	-0.0007	-0.47	0.0296	-0.0005	-0.33
DJY8LX		0.0215	-0.0025	-1.75	0.0292	-0.0009	-0.60
DVW4NY		0.0238	-0.0003	-0.19	0.0298	-0.0003	-0.20
E2W3CU		0.0257	0.0016	1.10	0.0317	0.0015	0.99
E3AJRT		0.0229	-0.0012	-0.80	0.0295	-0.0006	-0.38
EPH4QX		0.0238	-0.0003	-0.19	0.0302	0.0001	0.08
FHQ4QJ		0.0268	0.0027	1.86	0.0317	0.0016	1.04
FTCBFZ		0.0246	0.0005	0.36	0.0290	-0.0011	-0.72
HF4XNR		0.0248	0.0007	0.50	0.0308	0.0007	0.44
HQWM4Y		0.0252	0.0011	0.78	0.0302	0.0001	0.05
JHP78R		0.0226	-0.0015	-1.02	0.0276	-0.0025	-1.62
JLHCGM		0.0256	0.0015	1.06	0.0296	-0.0006	-0.37
JRWWVN		0.0246	0.0006	0.39	0.0316	0.0015	0.94
JWWLRU	M	0.0236	-0.0005	-0.34	No Data Reported		
K782D2		0.0254	0.0013	0.89	0.0311	0.0010	0.66
KFQKNK		0.0240	-0.0001	-0.05	0.0302	0.0001	0.05
KMFV9G		0.0222	-0.0019	-1.29	0.0282	-0.0019	-1.24
KQCNWK		0.0242	0.0001	0.09	0.0300	-0.0001	-0.08
L64YPF		0.0246	0.0005	0.34	0.0311	0.0010	0.62
L734JG		0.0207	-0.0033	-2.30	0.0276	-0.0025	-1.62
L8QJQD		0.0230	-0.0011	-0.74	0.0304	0.0003	0.18
LD8LDB		0.0220	-0.0021	-1.43	0.0280	-0.0021	-1.37
LNMTVW		0.0229	-0.0012	-0.80	0.0301	0.0000	-0.02
MMPNVU		0.0250	0.0010	0.66	0.0287	-0.0015	-0.94
MYZ4UM		0.0244	0.0003	0.20	0.0300	-0.0001	-0.08
NCWUZJ		0.0218	-0.0023	-1.57	0.0276	-0.0025	-1.62
NGYP3K		0.0222	-0.0019	-1.29	0.0278	-0.0023	-1.50



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 146

Effective Case Depth
SAE J423, SAE J78

WebCode	Data Flag	Sample C63			Sample C64		
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV
PW6HYM		0.0230	-0.0011	-0.74	0.0312	0.0011	0.70
QFBEPW		0.0226	-0.0015	-1.02	0.0290	-0.0011	-0.72
QN7CG6		0.0266	0.0025	1.73	0.0312	0.0011	0.72
QRQYH6		0.0242	0.0001	0.08	0.0316	0.0015	0.98
R2TR9B		0.0232	-0.0009	-0.60	0.0272	-0.0029	-1.88
R69B6Y		0.0216	-0.0025	-1.71	0.0298	-0.0003	-0.20
TLTGU4		0.0238	-0.0003	-0.19	0.0302	0.0001	0.05
TTMKMF	X	0.0188	-0.0053	-3.63	0.0232	-0.0069	-4.46
UZAR2R		0.0214	-0.0027	-1.84	0.0272	-0.0029	-1.88
V9WUYT		0.0237	-0.0003	-0.23	0.0309	0.0008	0.51
VKXDH9		0.0230	-0.0011	-0.74	0.0306	0.0005	0.31
W8VLY8		0.0238	-0.0003	-0.19	0.0286	-0.0015	-0.98
WU7JP3		0.0235	-0.0005	-0.37	0.0308	0.0007	0.43
WW24TE	*	0.0238	-0.0003	-0.19	0.0268	-0.0033	-2.14
WXWQ6J	*	0.0276	0.0036	2.46	0.0316	0.0015	0.94
XPAEBN		0.0253	0.0012	0.82	0.0305	0.0004	0.26
XUEYK9		0.0236	-0.0005	-0.31	0.0291	-0.0010	-0.63
XXRL8L		0.0234	-0.0007	-0.47	0.0300	-0.0001	-0.07
YJR3AU		0.0240	0.0000	-0.02	0.0318	0.0017	1.10
YK GK4F		0.0246	0.0005	0.36	0.0318	0.0017	1.09
Z7FA2E		0.0244	0.0003	0.22	0.0304	0.0003	0.18
ZGUF RM		0.0230	-0.0010	-0.71	0.0309	0.0008	0.50
ZMYBDH		0.0271	0.0030	2.09	0.0337	0.0036	2.31

Summary Statistics

	Sample C63		Sample C64	
Grand Means	0.0241	inches	0.0301	inches
Std Dev Btwn Labs	0.0015	inches	0.0015	inches

Samples C63, C64 : Steel, Steel

Statistics based on 65 of 70 reporting participants

Comments on Assigned Data Flags for Test #146

- 9JGMRC (X) - Data for both samples are low.
- AV3J6U (X) - Data for sample C63 are low.
- CEAJCL (X) - Data for sample C64 are high.
- JWWLRU (M) - Participant did not submit data for sample C64.
- TTMKMF (X) - Data for both samples are low.

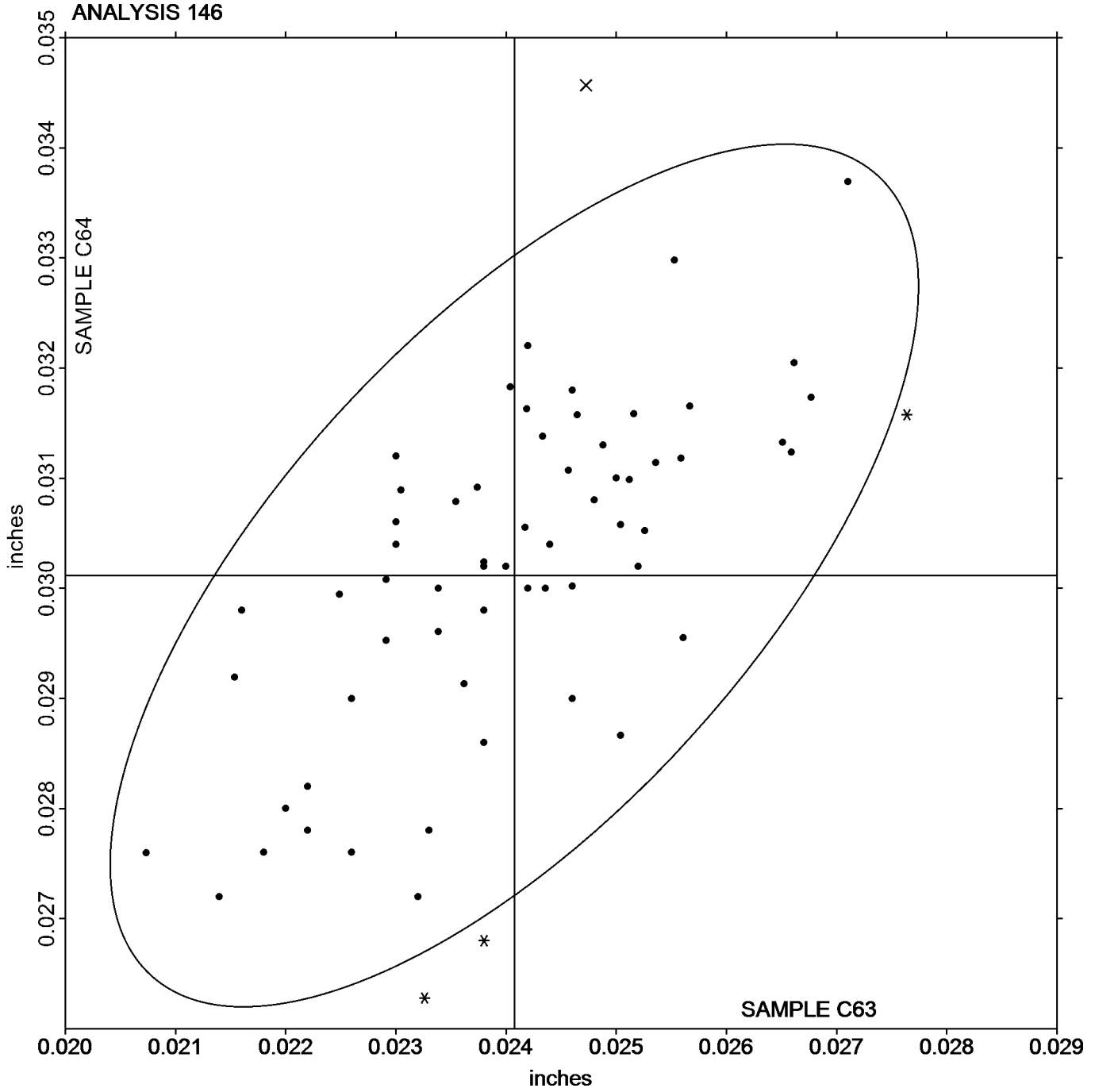


Analysis 146

Effective Case Depth
SAE J423, SAE J78

SAMPLE C63
0.0241 inches

SAMPLE C64
0.0301 inches





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 148

Grain Size (Inconel)
ASTM E112, ASTM E1382

WebCode	Data Flag	Sample J63			Sample J64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
26GHE8		5.90	-1.03	-1.11	5.10	-1.53	-1.56	Comparison Method
3PEKGZ		8.20	1.27	1.36	8.70	2.07	2.11	General Intercept
4KXJVT		6.90	-0.03	-0.04	6.60	-0.03	-0.03	Comparison Method
673EJ3		5.60	-1.33	-1.43	4.40	-2.23	-2.27	Comparison Method
8GRYUQ		7.90	0.97	1.04	7.60	0.97	0.99	Comparison Method
8RRUNF		6.79	-0.14	-0.15	6.70	0.07	0.07	General Intercept
9JGMRC		6.10	-0.83	-0.90	5.50	-1.13	-1.15	Comparison Method
BEQAVD		6.40	-0.53	-0.57	6.50	-0.13	-0.13	Comparison Method
CRDPKY		5.20	-1.73	-1.86	5.40	-1.23	-1.25	Comparison Method
E3AJRT		6.00	-0.93	-1.00	5.40	-1.23	-1.25	Comparison Method
F34GLK		7.00	0.07	0.07	6.20	-0.43	-0.44	Comparison Method
FPFDHV		5.40	-1.53	-1.65	5.90	-0.73	-0.74	Comparison Method
G2Q89E		6.60	-0.33	-0.36	6.60	-0.03	-0.03	Comparison Method
H9U8GD		7.00	0.07	0.07	7.20	0.57	0.58	Comparison Method
JHP78R		7.00	0.07	0.07	7.50	0.87	0.89	Comparison Method
JMLQDW		6.50	-0.43	-0.47	5.70	-0.93	-0.95	Comparison Method
KJFRDN		6.10	-0.83	-0.90	5.80	-0.83	-0.84	Comparison Method
KMFV9G		7.10	0.17	0.18	7.10	0.47	0.48	Comparison Method
LV646R		6.72	-0.21	-0.23	6.50	-0.13	-0.13	Abrams Three-Circle
MEVJ3T		8.34	1.41	1.51	7.58	0.95	0.97	Heyn Linear Intercept
NE7XNT	*	8.80	1.87	2.00	7.20	0.57	0.58	N/A
NUJ9E2		6.70	-0.23	-0.25	7.30	0.67	0.68	Comparison Method
R66PG7		8.89	1.95	2.10	9.17	2.54	2.59	General Intercept
T8RQ9Y		6.50	-0.43	-0.47	6.10	-0.53	-0.54	Comparison Method
TTMKMF		7.56	0.63	0.67	6.54	-0.09	-0.09	Comparison Method
UNEL4M		6.00	-0.93	-1.00	6.00	-0.63	-0.64	Comparison Method
WW24TE		5.80	-1.13	-1.22	5.80	-0.83	-0.84	Comparison Method
XDFXLM		7.08	0.15	0.16	7.74	1.11	1.13	Heyn Linear Intercept
XUEYK9		7.00	0.07	0.07	6.00	-0.63	-0.64	Comparison Method
YLYDB6		8.20	1.27	1.36	6.80	0.17	0.17	Comparison Method
YTE22Z		6.70	-0.23	-0.25	6.10	-0.53	-0.54	N/A
YY2Z7E		7.80	0.87	0.93	7.20	0.57	0.58	Comparison Method
Z7UUGH		7.00	0.07	0.07	7.50	0.87	0.89	Comparison Method
ZENZBJ		7.30	0.37	0.39	6.80	0.17	0.17	Comparison Method
ZMYBDH		6.52	-0.41	-0.44	6.18	-0.45	-0.46	General Intercept
ZW9GND		7.44	0.51	0.55	7.76	1.13	1.15	Abrams Three-Circle
ZYRWJD		8.50	1.57	1.68	7.10	0.47	0.48	Comparison Method

Summary Statistics

	Sample J63		Sample J64	
Grand Means	6.93	ASTM Grain Size	6.63	ASTM Grain Size
Std Dev Btwn Labs	0.93	ASTM Grain Size	0.98	ASTM Grain Size

Samples J63, J64 : Inco 718, Waspaloy

Statistics based on 37 of 37 reporting participants



Analysis 148

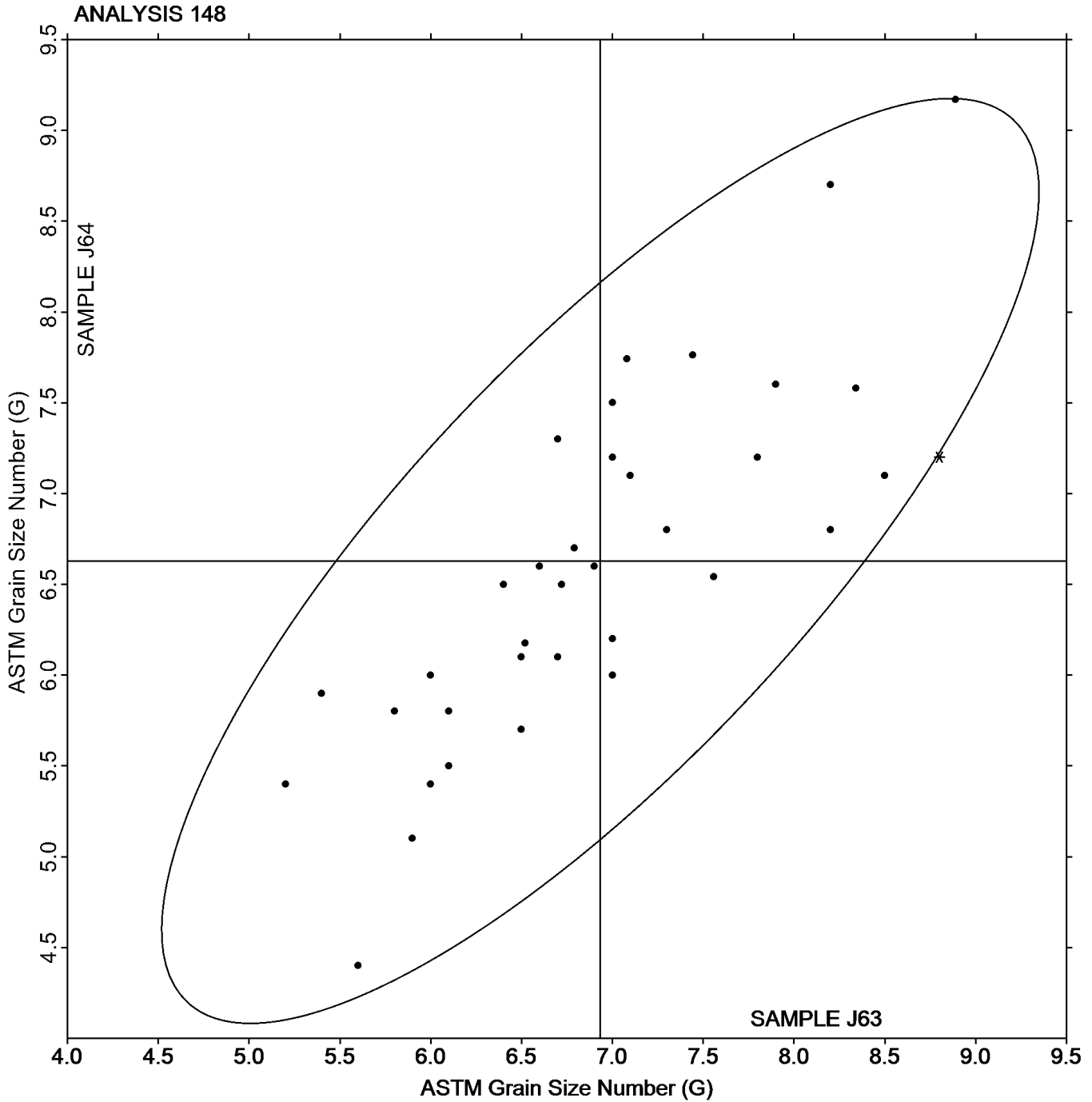
Grain Size (Inconel)
ASTM E112, ASTM E1382

SAMPLE J63

SAMPLE J64

6.93 ASTM Grain Size Number (G)

6.63 ASTM Grain Size Number (G)





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 160

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

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		81.67	-0.07	-0.14	82.71	0.14	0.29	OE
28L7WH		81.73	-0.01	-0.02	82.71	0.14	0.29	OE
4LHX2J		81.90	0.16	0.32	82.80	0.23	0.48	OE
8TL99Y		81.76	0.02	0.04	82.75	0.18	0.37	AA
AAM2YJ		81.64	-0.10	-0.20	82.47	-0.10	-0.21	OE
C2MCG7		81.73	0.00	-0.01	82.65	0.08	0.17	OE
CUYHDT		81.97	0.23	0.47	82.62	0.05	0.11	EL
DJY8LX		81.73	0.00	-0.01	82.71	0.14	0.30	GD
E3AJRT		81.48	-0.25	-0.51	82.49	-0.08	-0.17	OE
EGQJF7		81.63	-0.11	-0.22	82.79	0.22	0.47	OE
FYG4J4		81.80	0.06	0.13	82.60	0.03	0.06	OE
JRWWVN		81.79	0.05	0.11	82.34	-0.23	-0.47	GR
KDLXXA		81.86	0.12	0.25	82.33	-0.24	-0.51	XX
MJNPCP		82.00	0.26	0.53	82.67	0.10	0.20	IC
QK48VK		80.67	-1.07	-2.16	81.47	-1.10	-2.30	OE
RPGAUM	*	83.27	1.53	3.09	84.03	1.46	3.06	OE
RQ6UBQ		81.84	0.10	0.21	82.77	0.20	0.42	WD
RU9LLC		80.63	-1.10	-2.23	81.50	-1.07	-2.23	OE
VYCQP9		81.66	-0.08	-0.16	82.51	-0.06	-0.12	WD
WP2N48		81.87	0.13	0.26	82.67	0.10	0.20	OE
WW24TE		81.96	0.23	0.46	82.85	0.28	0.58	OE
WXGFD7		81.60	-0.14	-0.28	82.06	-0.51	-1.07	EL
XDFXLM	X	85.67	3.93	7.93	86.27	3.70	7.74	WD
YGYCPN	*	82.43	0.70	1.40	82.57	0.00	0.00	IC
Z6LLJJ		81.03	-0.70	-1.42	82.03	-0.54	-1.12	OE
Z7FA2E		81.57	-0.16	-0.33	82.98	0.41	0.87	OE
ZMYBDH		81.97	0.23	0.46	82.73	0.16	0.34	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	81.74	Percent	82.57	Percent
Std Dev Btwn Labs	0.50	Percent	0.48	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 26 of 27 reporting participants

Key to Method Codes Reported by Participants

- | | | | |
|----|--|----|---|
| AA | Spectrometry - Atomic Absorption (AAS) | 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 |

Comments on Assigned Data Flags for Test #160

XDFXLM (X) - Data for both samples are high. Possible Systematic Error.



Analysis 160

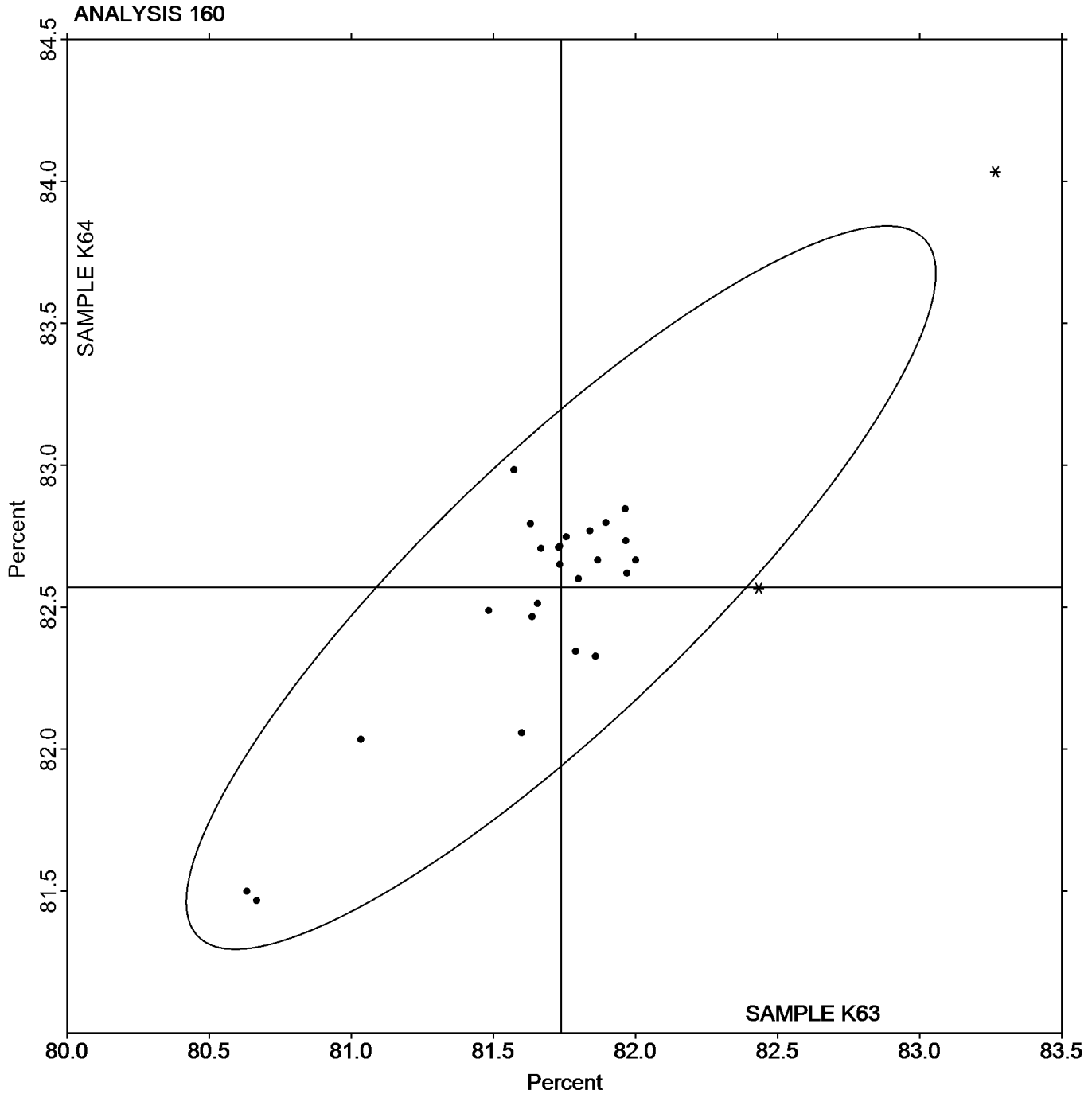
Copper-based Alloy, Element #1
COPPER (Cu)

SAMPLE K63

81.74 Percent

SAMPLE K64

82.57 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 161

Copper-based Alloy, Element #2
TIN (Sn)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		6.933	0.088	0.74	6.497	0.074	0.62	OE
28L7WH		6.907	0.061	0.51	6.450	0.028	0.23	OE
4LHX2J		6.850	0.005	0.04	6.440	0.017	0.15	OE
8TL99Y	X	8.354	1.509	12.62	7.775	1.352	11.29	ED
AAM2YJ		6.994	0.149	1.25	6.521	0.098	0.82	OE
C2MCG7		6.813	-0.032	-0.27	6.433	0.011	0.09	OE
DJY8LX		6.639	-0.206	-1.72	6.325	-0.097	-0.81	GD
E3AJRT	*	6.596	-0.249	-2.08	6.096	-0.326	-2.72	OE
EGQJF7		6.787	-0.059	-0.49	6.381	-0.041	-0.34	OE
FYG4J4		6.810	-0.035	-0.29	6.390	-0.032	-0.27	OE
JRWWVN		6.804	-0.042	-0.35	6.387	-0.036	-0.30	IC
KDLXXA	*	7.171	0.326	2.73	6.790	0.367	3.07	AA
MJNCP		6.747	-0.099	-0.82	6.373	-0.049	-0.41	IC
QK48VK		6.723	-0.122	-1.02	6.313	-0.109	-0.91	OE
R69B6Y		6.913	0.068	0.57	6.440	0.018	0.15	OE
RPGAUM	X	7.657	0.811	6.79	7.117	0.694	5.80	OE
RQ6UBQ		6.824	-0.021	-0.18	6.361	-0.061	-0.51	OE
RU9LLC		6.907	0.061	0.51	6.450	0.028	0.23	OE
VYCQP9		6.903	0.057	0.48	6.435	0.013	0.11	WD
W9VJFV		6.867	0.021	0.18	6.452	0.030	0.25	IC
WP2N48		6.720	-0.125	-1.05	6.327	-0.096	-0.80	OE
WW24TE		6.693	-0.152	-1.27	6.271	-0.151	-1.26	OE
WXGFD7		6.907	0.061	0.51	6.573	0.151	1.26	IC
XDFXLM		6.898	0.053	0.44	6.459	0.037	0.30	WD
YGYCPN		6.903	0.058	0.49	6.387	-0.036	-0.30	IC
Z6LLJJ		6.943	0.098	0.82	6.483	0.061	0.51	OE
Z7FA2E		6.929	0.084	0.70	6.499	0.077	0.64	OE
ZMYBDH		6.793	-0.052	-0.43	6.443	0.021	0.18	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	6.845	Percent	6.422	Percent
Std Dev Btwn Labs	0.120	Percent	0.120	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 26 of 28 reporting participants

Key to Method Codes Reported by Participants

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)

Comments on Assigned Data Flags for Test #161

8TL99Y (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample K64.

RPGAUM (X) - Data for both samples are high. Possible Systematic Error.

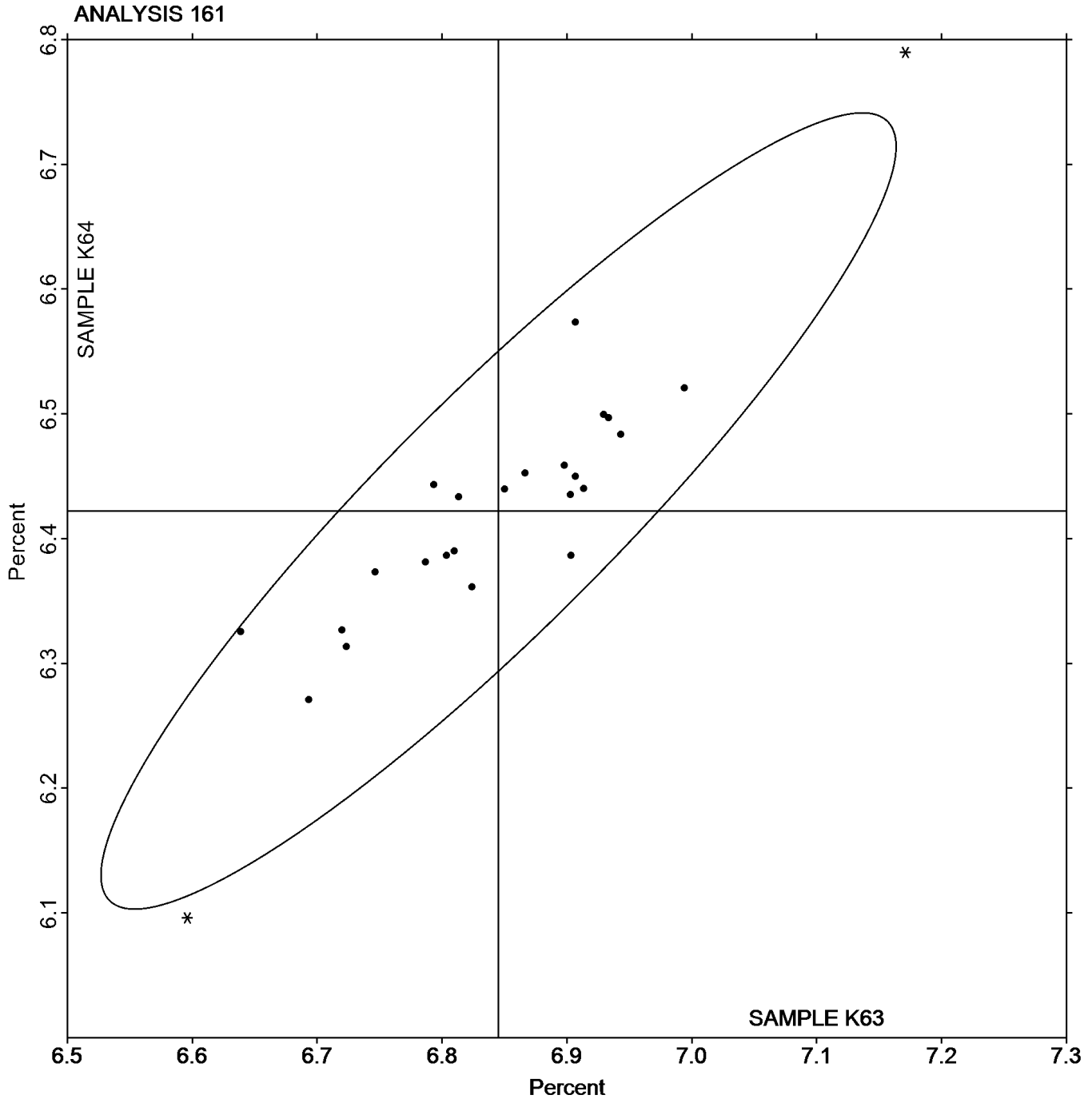


Analysis 161

Copper-based Alloy, Element #2
TIN (Sn)

SAMPLE K63
6.845 Percent

SAMPLE K64
6.422 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 162

Copper-based Alloy, Element #3
LEAD (Pb)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		6.997	-0.001	0.00	6.647	-0.027	-0.11	OE
28L7WH		6.963	-0.034	-0.14	6.673	0.000	0.00	OE
4LHX2J		6.820	-0.177	-0.71	6.406	-0.267	-1.14	OE
8TL99Y	X	5.835	-1.162	-4.66	5.467	-1.207	-5.16	ED
AAM2YJ		7.100	0.103	0.41	6.896	0.222	0.95	OE
C2MCG7		6.810	-0.187	-0.75	6.563	-0.110	-0.47	OE
DJY8LX		7.053	0.055	0.22	6.722	0.049	0.21	GD
E3AJRT		7.355	0.357	1.43	6.981	0.308	1.32	OE
EGQJF7		7.114	0.117	0.47	6.611	-0.062	-0.27	OE
FYG4J4		6.990	-0.007	-0.03	6.650	-0.023	-0.10	OE
JRWWVN		6.960	-0.037	-0.15	6.808	0.135	0.58	IC
KDLXXA		7.305	0.307	1.23	7.067	0.393	1.68	AA
MJNPCP		6.873	-0.124	-0.50	6.597	-0.077	-0.33	IC
R69B6Y		7.070	0.073	0.29	6.700	0.027	0.11	OE
RPGAUM	X	4.443	-2.554	-10.23	4.287	-2.387	-10.21	OE
RQ6UBQ		6.453	-0.544	-2.18	6.275	-0.398	-1.70	OE
RU9LLC	*	7.727	0.729	2.92	7.380	0.707	3.02	OE
VYCQP9		7.027	0.030	0.12	6.680	0.007	0.03	WD
W9VJFV		7.027	0.029	0.12	6.671	-0.002	-0.01	IC
WP2N48		6.850	-0.147	-0.59	6.503	-0.170	-0.73	OE
WW24TE		6.789	-0.208	-0.83	6.482	-0.191	-0.82	OE
WXGFD7		6.723	-0.274	-1.10	6.623	-0.050	-0.21	IC
XDFXLM		6.956	-0.041	-0.16	6.602	-0.071	-0.30	WD
YGYCPN		6.927	-0.071	-0.28	6.610	-0.063	-0.27	IC
Z6LLJJ		7.357	0.359	1.44	6.850	0.177	0.76	OE
Z7FA2E		6.892	-0.105	-0.42	6.417	-0.256	-1.10	OE
ZMYBDH		6.797	-0.201	-0.80	6.417	-0.257	-1.10	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	6.997	Percent	6.673	Percent
Std Dev Btw Labs	0.250	Percent	0.234	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 25 of 27 reporting participants

Key to Method Codes Reported by Participants

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)

Comments on Assigned Data Flags for Test #162

8TL99Y (X) - Data for both samples are low. Possible Systematic Error.

RPGAUM (X) - Data for both samples are low. Possible Systematic Error.



Analysis 162

Copper-based Alloy, Element #3

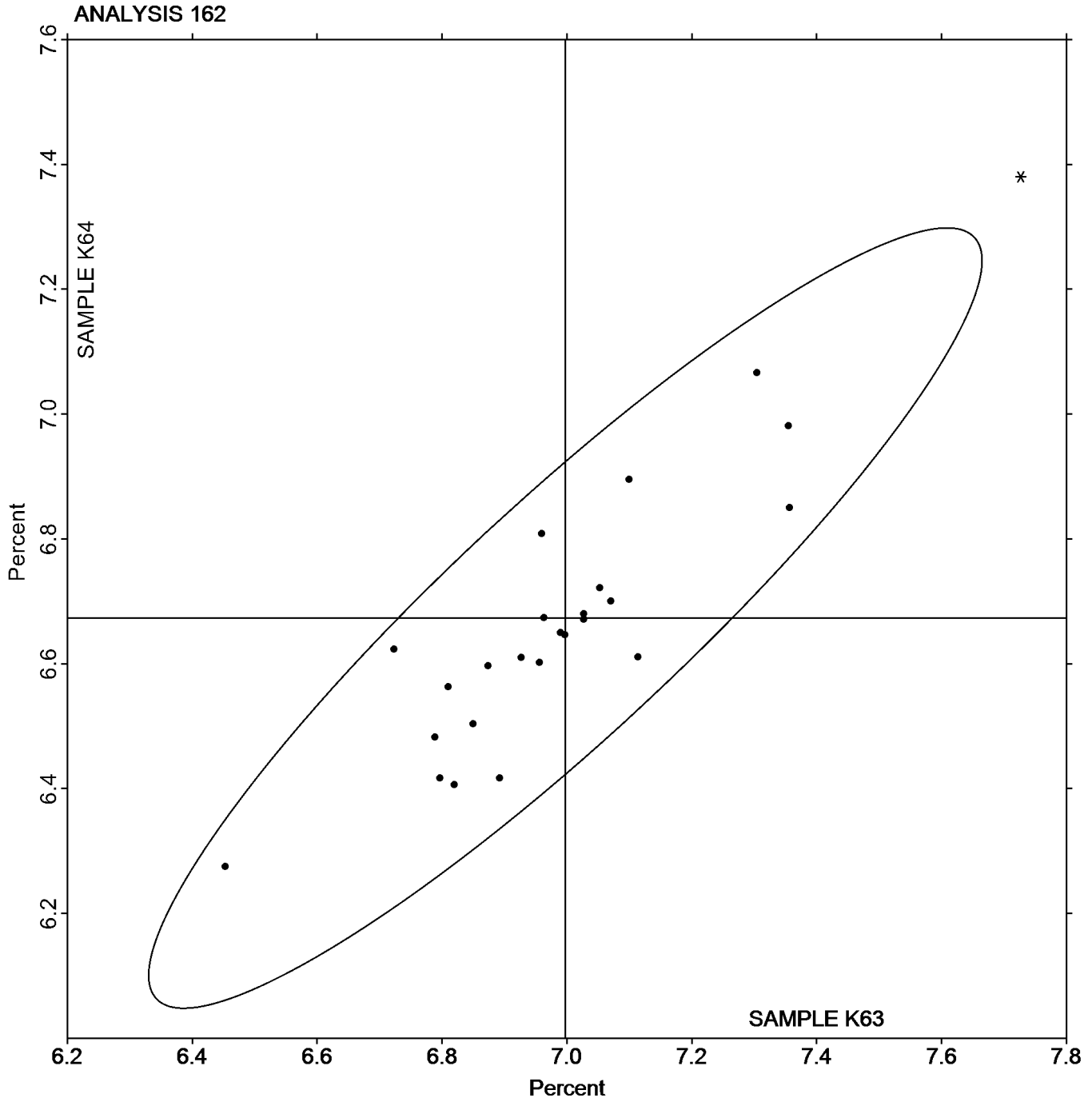
LEAD (Pb)

SAMPLE K63

SAMPLE K64

6.997 Percent

6.673 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 163

Copper-based Alloy, Element #4
ZINC (Zn)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		3.883	-0.041	-0.41	3.403	-0.073	-0.79	OE
28L7WH		3.837	-0.088	-0.88	3.413	-0.063	-0.68	OE
4LHX2J		3.837	-0.087	-0.87	3.405	-0.072	-0.77	OE
8TL99Y		3.854	-0.070	-0.70	3.476	0.000	0.00	AA
AAM2YJ		3.820	-0.104	-1.04	3.396	-0.081	-0.87	OE
C2MCG7		3.973	0.049	0.49	3.490	0.014	0.15	OE
DJY8LX		3.792	-0.132	-1.32	3.362	-0.114	-1.23	GD
E3AJRT		4.067	0.143	1.43	3.560	0.084	0.90	OE
EGQJF7		3.924	0.000	0.00	3.482	0.006	0.06	OE
FYG4J4		3.860	-0.064	-0.64	3.390	-0.086	-0.93	OE
JRWWVN		4.031	0.107	1.07	3.640	0.164	1.77	IC
KDLXXA	*	3.908	-0.016	-0.16	3.691	0.215	2.32	AA
MJNCP		3.830	-0.094	-0.94	3.373	-0.103	-1.11	XX
QK48VK		4.180	0.256	2.56	3.703	0.227	2.45	OE
R69B6Y		3.896	-0.028	-0.28	3.451	-0.026	-0.28	OE
RPGAUM		4.027	0.102	1.03	3.550	0.074	0.80	OE
RQ6UBQ		3.845	-0.080	-0.80	3.434	-0.042	-0.46	OE
RU9LLC		3.997	0.072	0.73	3.547	0.070	0.76	OE
VYCQP9		3.900	-0.024	-0.24	3.442	-0.034	-0.37	XX
W9VJFV		3.904	-0.021	-0.21	3.469	-0.007	-0.07	IC
WP2N48		4.087	0.162	1.63	3.633	0.157	1.70	OE
WW24TE		3.873	-0.051	-0.51	3.441	-0.035	-0.38	OE
WXGFD7		3.890	-0.034	-0.34	3.483	0.007	0.08	IC
XDFXLM		3.860	-0.064	-0.64	3.407	-0.070	-0.75	WD
YGYPN		3.837	-0.088	-0.88	3.347	-0.130	-1.40	IC
Z6LLJJ		4.093	0.169	1.69	3.627	0.150	1.62	OE
Z7FA2E		3.962	0.038	0.38	3.489	0.013	0.14	OE
ZMYBDH		3.893	-0.031	-0.31	3.443	-0.033	-0.35	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	3.924	Percent	3.476	Percent
Std Dev Btwn Labs	0.100	Percent	0.093	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 27 of 28 reporting participants

Key to Method Codes Reported by Participants

- | | | | |
|-----------|--|-----------|---|
| AA | Spectrometry - Atomic Absorption (AAS) | 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 |



Analysis 163

Copper-based Alloy, Element #4

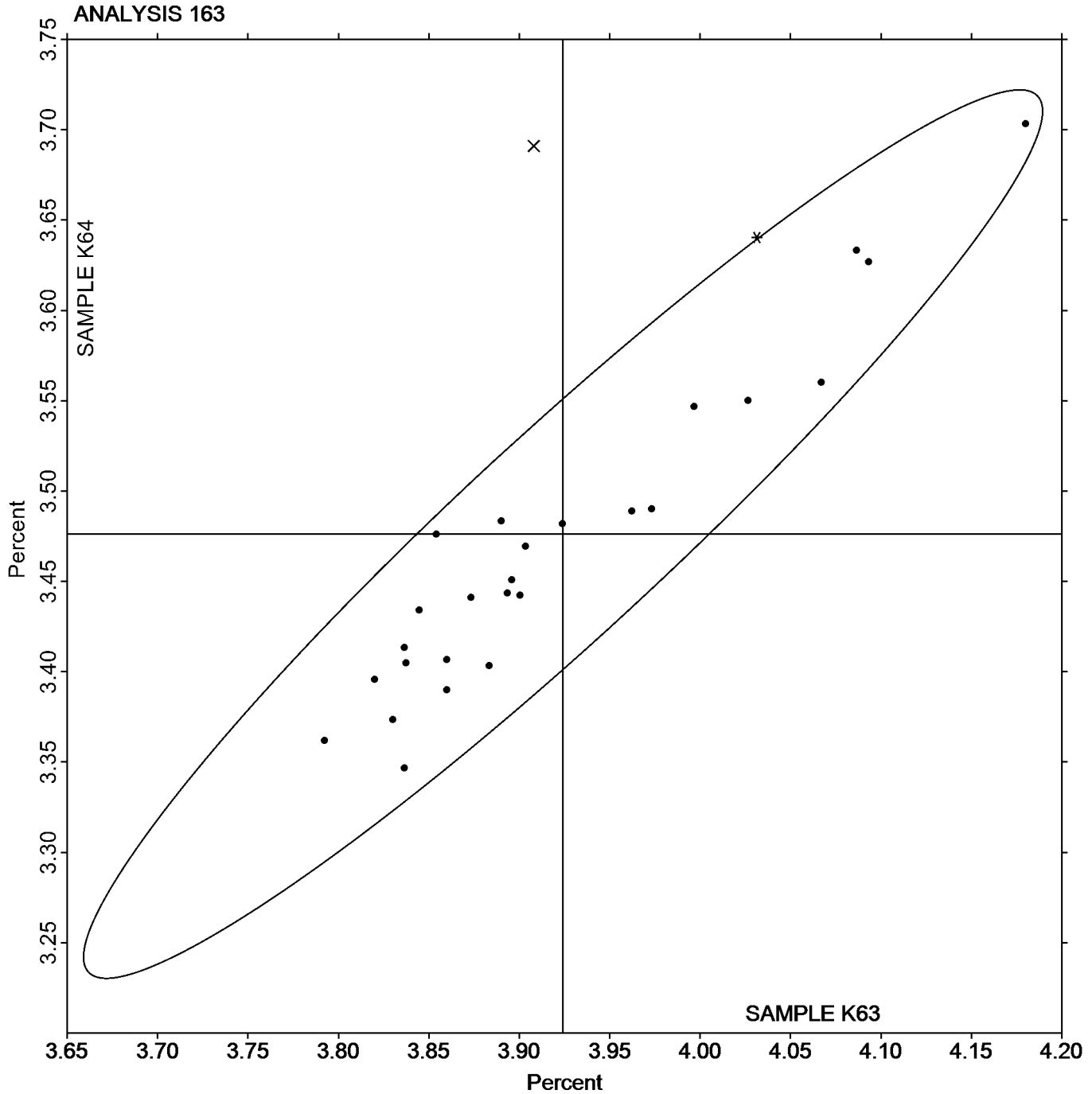
ZINC (Zn)

SAMPLE K63

SAMPLE K64

3.924 Percent

3.476 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 164

Copper-based Alloy, Element #5
IRON (Fe)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH	*	0.0840	-0.0004	-0.06	0.0387	0.0099	3.05	OE
28L7WH	X	0.00833	-0.0760	-13.12	0.0393	0.0106	3.26	OE
4LHX2J		0.0807	-0.0037	-0.64	0.0273	-0.0014	-0.44	OE
AAM2YJ		0.0823	-0.0020	-0.35	0.0253	-0.0034	-1.05	OE
C2MCG7		0.0820	-0.0023	-0.40	0.0277	-0.0011	-0.33	OE
DJY8LX		0.0823	-0.0020	-0.35	0.0293	0.0006	0.18	GD
E3AJRT		0.0860	0.0016	0.28	0.0253	-0.0034	-1.06	XX
EGQJF7		0.0803	-0.0040	-0.70	0.0270	-0.0017	-0.54	OE
FYG4J4		0.0730	-0.0114	-1.96	0.0320	0.0033	1.00	OE
JRWWVN		0.0829	-0.0015	-0.26	0.0275	-0.0012	-0.37	IC
KDLXXA		0.0930	0.0086	1.49	0.0311	0.0023	0.71	AA
MJNCP		0.0827	-0.0017	-0.29	0.0267	-0.0021	-0.64	IC
QK48VK		0.0745	-0.0099	-1.71	0.0260	-0.0027	-0.84	OE
R69B6Y		0.0867	0.0023	0.40	0.0279	-0.0009	-0.27	OE
RPGAUM		0.0781	-0.0063	-1.09	0.0236	-0.0051	-1.59	OE
RQ6UBQ		0.0907	0.0063	1.09	0.0304	0.0016	0.50	OE
RU9LLC		0.0997	0.0153	2.64	0.0330	0.0043	1.31	XX
VYCQP9		0.0878	0.0034	0.59	0.0282	-0.0005	-0.17	WD
W9VJFV		0.0860	0.0016	0.28	0.0284	-0.0003	-0.10	IC
WP2N48		0.0833	-0.0011	-0.19	0.0293	0.0006	0.18	OE
WW24TE		0.0850	0.0006	0.11	0.0268	-0.0019	-0.59	OE
WXGFD7		0.0896	0.0052	0.90	0.0297	0.0009	0.28	IC
XDFXLM	X	0.1135	0.0291	5.02	0.0500	0.0213	6.54	XX
Z6LLJJ		0.0883	0.0040	0.68	0.0330	0.0043	1.31	OE
Z7FA2E	X	0.0551	-0.0293	-5.06	0.0300	0.0013	0.39	OE
ZMYBDH		0.0817	-0.0027	-0.47	0.0270	-0.0017	-0.54	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	0.0844	Percent	0.0287	Percent
Std Dev Btwn Labs	0.0058	Percent	0.0032	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 23 of 26 reporting participants

Key to Method Codes Reported by Participants

- AA Spectrometry - Atomic Absorption (AAS)
- 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

Comments on Assigned Data Flags for Test #164

28L7WH (X) - Data for sample K63 are low and data for sample K64 are high.

XDFXLM (X) - Data for both samples are high.

Z7FA2E (X) - Data for sample K63 are low. Inconsistent within the determinations of sample K64.

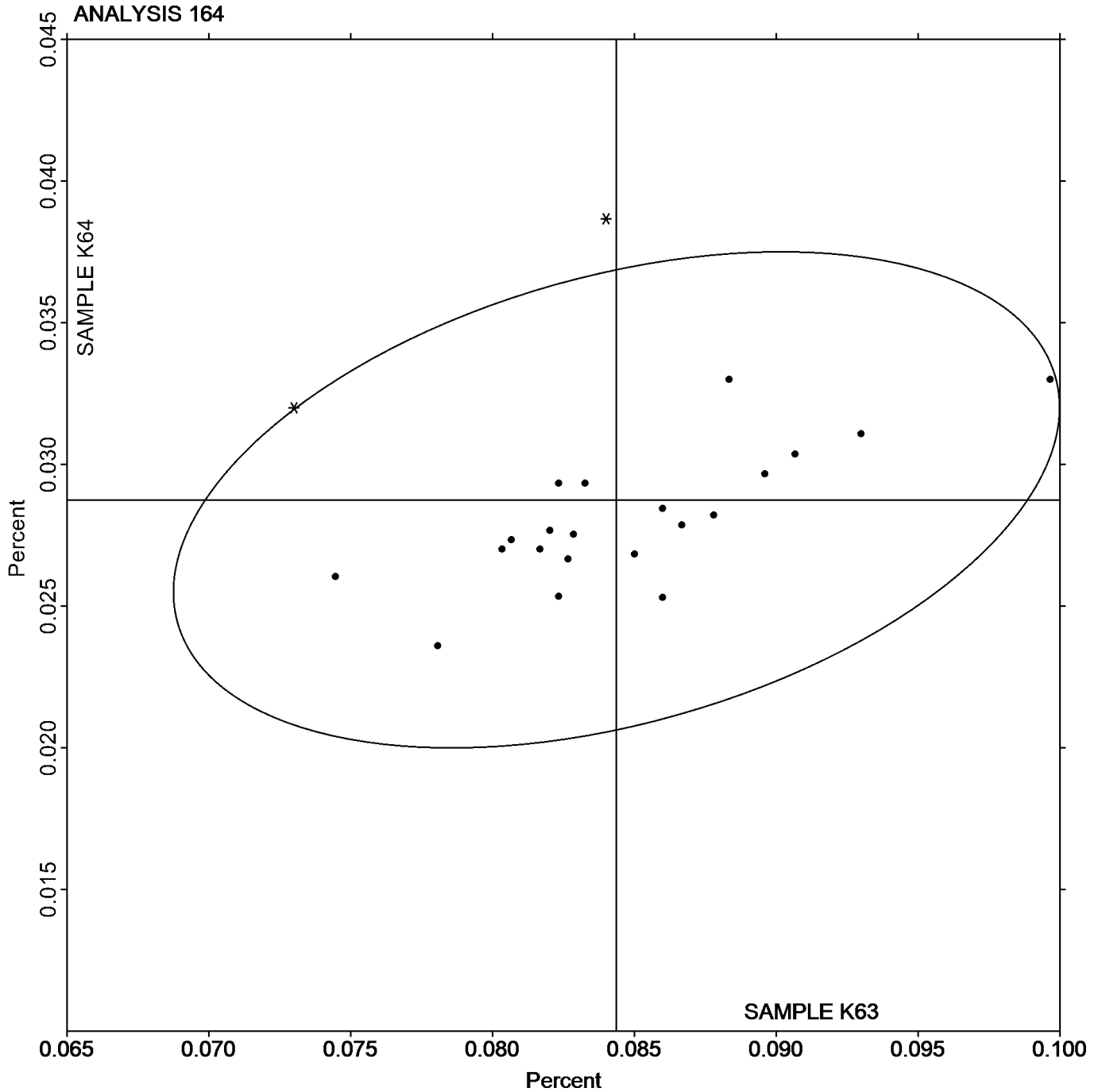


Analysis 164

Copper-based Alloy, Element #5
IRON (Fe)

SAMPLE K63
0.0844 Percent

SAMPLE K64
0.0287 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 165

Copper-based Alloy, Element #6
NICKEL (Ni)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		0.1312	-0.0165	-1.79	0.4481	0.0043	0.30	OE
28L7WH		0.1300	-0.0178	-1.93	0.4500	0.0062	0.44	OE
4LHX2J		0.1477	-0.0001	-0.01	0.4280	-0.0158	-1.13	OE
8TL99Y	X	0.2037	0.0559	6.06	0.5377	0.0938	6.71	ED
AAM2YJ		0.1390	-0.0088	-0.95	0.4177	-0.0262	-1.87	OE
C2MCG7		0.1423	-0.0054	-0.59	0.4490	0.0052	0.37	OE
DJY8LX		0.1437	-0.0041	-0.44	0.4297	-0.0142	-1.01	GD
E3AJRT		0.1410	-0.0068	-0.73	0.4710	0.0272	1.94	OE
EGQJF7		0.1620	0.0142	1.54	0.4440	0.0002	0.01	OE
FYG4J4		0.1500	0.0022	0.24	0.4400	-0.0038	-0.27	OE
JRWVVN		0.1520	0.0043	0.46	0.4524	0.0085	0.61	IC
KDLXXA		0.1517	0.0039	0.42	0.4540	0.0102	0.73	AA
MJNPCP		0.1533	0.0056	0.60	0.4500	0.0062	0.44	IC
QK48VK		0.1437	-0.0041	-0.44	0.4423	-0.0015	-0.11	OE
R69B6Y		0.1303	-0.0174	-1.89	0.4273	-0.0165	-1.18	OE
RPGAUM		0.1603	0.0126	1.36	0.4560	0.0122	0.87	OE
RQ6UBQ		0.1477	0.0000	0.00	0.4394	-0.0045	-0.32	OE
RU9LLC		0.1567	0.0089	0.97	0.4503	0.0065	0.46	OE
VYCQP9		0.1389	-0.0089	-0.96	0.4445	0.0006	0.04	WD
W9VJFV		0.1390	-0.0088	-0.95	0.4290	-0.0148	-1.06	IC
WP2N48		0.1600	0.0122	1.33	0.4307	-0.0132	-0.94	OE
WW24TE		0.1480	0.0002	0.03	0.4403	-0.0035	-0.25	OE
WXGFD7		0.1517	0.0039	0.42	0.4427	-0.0012	-0.08	IC
XDFXLM		0.1545	0.0067	0.73	0.4730	0.0292	2.09	WD
YGYCPN		0.1487	0.0009	0.10	0.4393	-0.0045	-0.32	IC
Z6LLJJ		0.1543	0.0066	0.71	0.4717	0.0278	1.99	OE
Z7FA2E		0.1493	0.0016	0.17	0.4260	-0.0178	-1.28	OE
ZMYBDH		0.1623	0.0146	1.58	0.4373	-0.0065	-0.47	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	0.1478	Percent	0.4438	Percent
Std Dev Btwn Labs	0.0092	Percent	0.0140	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 27 of 28 reporting participants

Key to Method Codes Reported by Participants

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)

Comments on Assigned Data Flags for Test #165

8TL99Y (X) - Data for both samples are high. Inconsistent within the determinations of both samples.



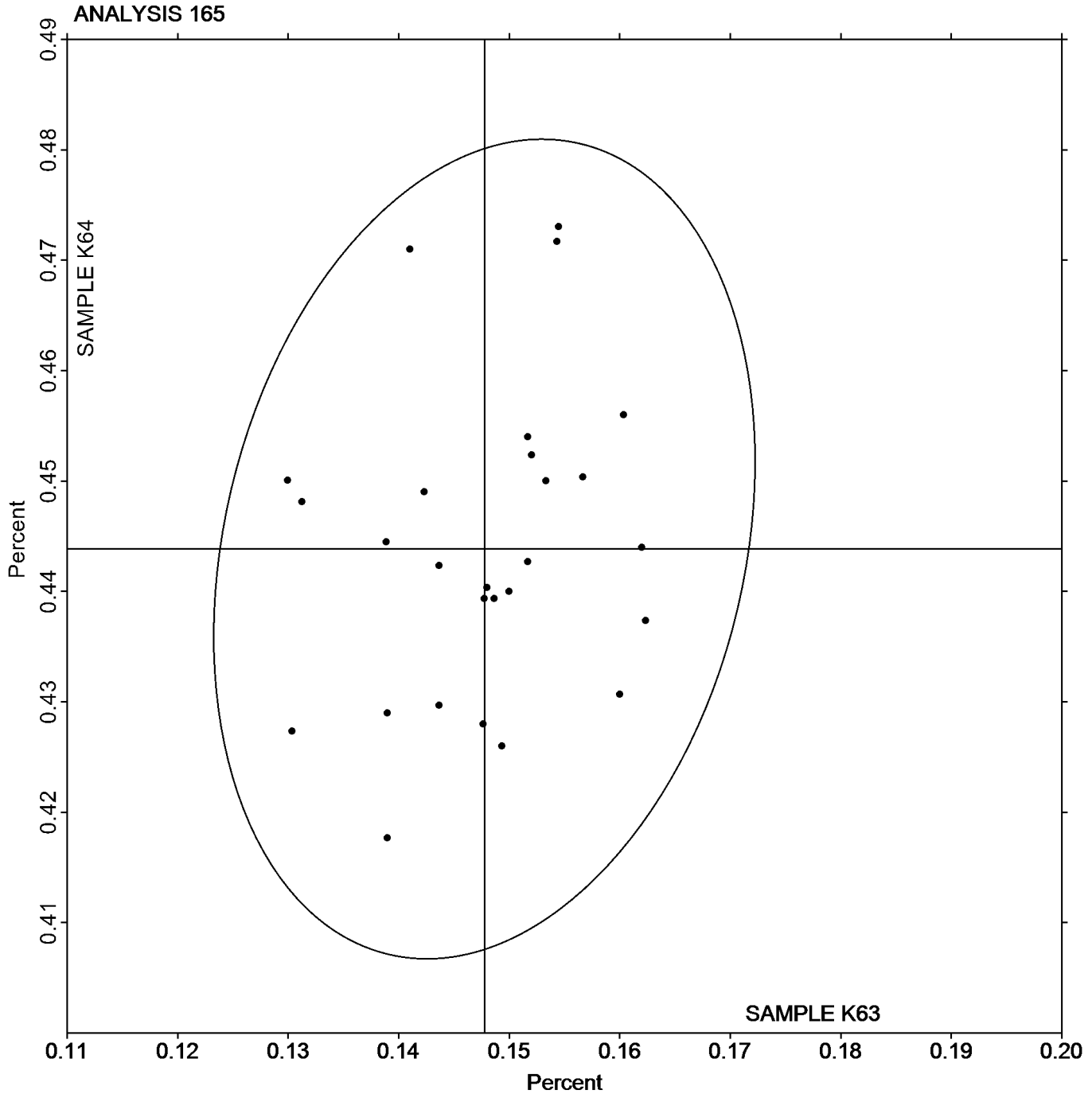
Analysis 165

Copper-based Alloy, Element #6

NICKEL (Ni)

SAMPLE K63
0.1478 Percent

SAMPLE K64
0.4438 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 166

Copper-based Alloy, Element #7
SULFUR (S)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		0.0457	0.0041	0.84	0.0326	0.0009	0.28	OE
28L7WH		0.0456	0.0041	0.83	0.0341	0.0023	0.75	OE
4LHX2J		0.0410	-0.0006	-0.12	0.0322	0.0004	0.14	OE
AAM2YJ		0.0364	-0.0051	-1.05	0.0263	-0.0055	-1.75	OE
C2MCG7		0.0458	0.0043	0.87	0.0328	0.0011	0.34	OE
DJY8LX		0.0430	0.0014	0.29	0.0333	0.0016	0.51	GD
E3AJRT		0.0509	0.0093	1.91	0.0384	0.0067	2.13	OE
EGQJF7		0.0437	0.0021	0.43	0.0340	0.0023	0.72	OE
FYG4J4		0.0400	-0.0016	-0.32	0.0320	0.0003	0.08	OE
JRWWVN		0.0390	-0.0026	-0.53	0.0299	-0.0019	-0.60	IC
KDLXXA		0.0317	-0.0099	-2.03	0.0245	-0.0073	-2.33	OE
MJNPCP		0.0417	0.0001	0.02	0.0323	0.0006	0.19	CI
QK48VK		0.0441	0.0025	0.51	0.0346	0.0029	0.92	XX
R69B6Y		0.0454	0.0038	0.78	0.0343	0.0025	0.81	OE
RPGAUM		0.0476	0.0060	1.23	0.0358	0.0040	1.29	OE
RQ6UBQ		0.0343	-0.0072	-1.48	0.0279	-0.0038	-1.23	OE
RU9LLC		0.0427	0.0011	0.22	0.0333	0.0016	0.51	OE
W9VJFV		0.0454	0.0038	0.78	0.0337	0.0019	0.62	CO
WP2N48		0.0394	-0.0022	-0.45	0.0311	-0.0006	-0.19	OE
WW24TE		0.0419	0.0004	0.07	0.0310	-0.0008	-0.25	OE
XDFXLM		0.0421	0.0005	0.11	0.0311	-0.0007	-0.21	CO
YGYCPN		0.0417	0.0001	0.02	0.0320	0.0003	0.08	XX
Z6LLJJ		0.0407	-0.0009	-0.19	0.0303	-0.0014	-0.45	OE
Z7FA2E	*	0.0288	-0.0127	-2.61	0.0264	-0.0054	-1.72	CO
ZMYBDH		0.0409	-0.0006	-0.13	0.0297	-0.0020	-0.65	CO

Summary Statistics

	Sample K63		Sample K64	
Grand Means	0.0416	Percent	0.0317	Percent
Stnd Dev Btrwn Labs	0.0049	Percent	0.0031	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 25 of 25 reporting participants

Key to Method Codes Reported by Participants

- | | | | |
|----|---------------------------------------|----|---|
| CI | Combustion / IR | CO | Combustion |
| GD | Spectrometry - Glow Discharge (GDS) | IC | Spectrometry - Inductively Coupled Plasma (ICP) |
| OE | Spectrometry - Optical Emission (OES) | XX | Please Indicate Method Used for Current Element |



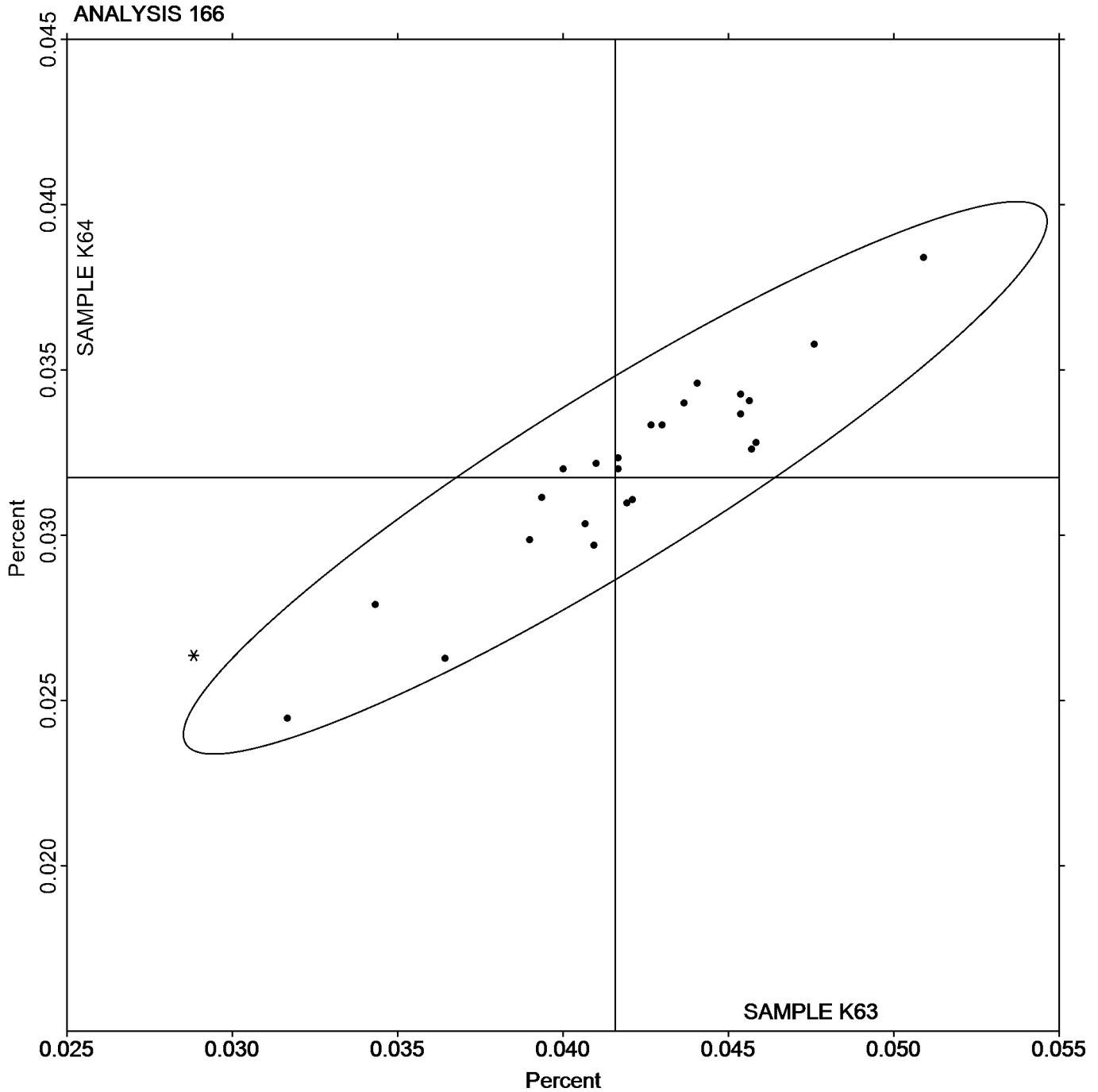
Analysis 166

Copper-based Alloy, Element #7

SULFUR (S)

SAMPLE K63
0.0416 Percent

SAMPLE K64
0.0317 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 167

Copper-based Alloy, Element #8
PHOSPHORUS (P)

WebCode	Data Flag	Sample K63			Sample K64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
24MUZH		0.0453	0.0085	1.41	0.0163	0.0006	0.17	OE
28L7WH		0.0461	0.0093	1.54	0.0173	0.0017	0.45	OE
4LHX2J		0.0403	0.0035	0.58	0.0145	-0.0011	-0.29	OE
AAM2YJ		0.0364	-0.0004	-0.07	0.0134	-0.0022	-0.59	OE
DJY8LX		0.0320	-0.0049	-0.81	0.0107	-0.0050	-1.31	GD
E3AJRT		0.0352	-0.0017	-0.27	0.0122	-0.0034	-0.90	OE
EGQJF7		0.0270	-0.0099	-1.64	0.0130	-0.0026	-0.69	OE
FYG4J4		0.0360	-0.0009	-0.14	0.0140	-0.0016	-0.43	OE
JRWVWN		0.0334	-0.0035	-0.57	0.0140	-0.0017	-0.44	IC
KDLXXA		0.0346	-0.0022	-0.37	0.0195	0.0039	1.02	XX
MJNPCP		0.0377	0.0008	0.13	0.0143	-0.0013	-0.34	XX
QK48VK	*	0.0191	-0.0177	-2.94	0.00897	-0.0067	-1.75	OE
R69B6Y		0.0374	0.0005	0.09	0.0143	-0.0013	-0.35	OE
RPGAUM		0.0430	0.0061	1.01	0.0192	0.0035	0.93	OE
RQ6UBQ		0.0402	0.0033	0.55	0.0193	0.0037	0.98	OE
RU9LLC		0.0470	0.0101	1.68	0.0220	0.0064	1.68	OE
VYCQP9		0.0437	0.0068	1.13	0.0232	0.0076	2.00	WD
W9VJFV		0.0371	0.0003	0.05	0.0140	-0.0017	-0.44	IC
WP2N48		0.0365	-0.0004	-0.06	0.0154	-0.0003	-0.07	OE
WW24TE		0.0398	0.0029	0.48	0.0245	0.0089	2.34	OE
WXGFD7		0.0318	-0.0051	-0.84	0.0128	-0.0028	-0.74	IC
XDFXLM		0.0367	-0.0001	-0.02	0.0138	-0.0019	-0.49	WD
YGYCPN		0.0363	-0.0005	-0.09	0.0130	-0.0026	-0.69	XX
Z6LLJJ		0.0347	-0.0022	-0.36	0.0150	-0.0006	-0.16	OE
ZMYBDH		0.0340	-0.0029	-0.47	0.0160	0.0004	0.10	OE

Summary Statistics

	Sample K63		Sample K64	
Grand Means	0.0369	Percent	0.0156	Percent
Std Dev Btwn Labs	0.0060	Percent	0.0038	Percent

Samples K63, K64 : CDA932, CDA932

Statistics based on 25 of 25 reporting participants

Key to Method Codes Reported by Participants

- GD Spectrometry - Glow Discharge (GDS)
- OE Spectrometry - Optical Emission (OES)
- XX Please Indicate Method Used for Current Element
- IC Spectrometry - Inductively Coupled Plasma (ICP)
- WD X-Ray Fluorescence - Wavelength Dispersive (WDX)

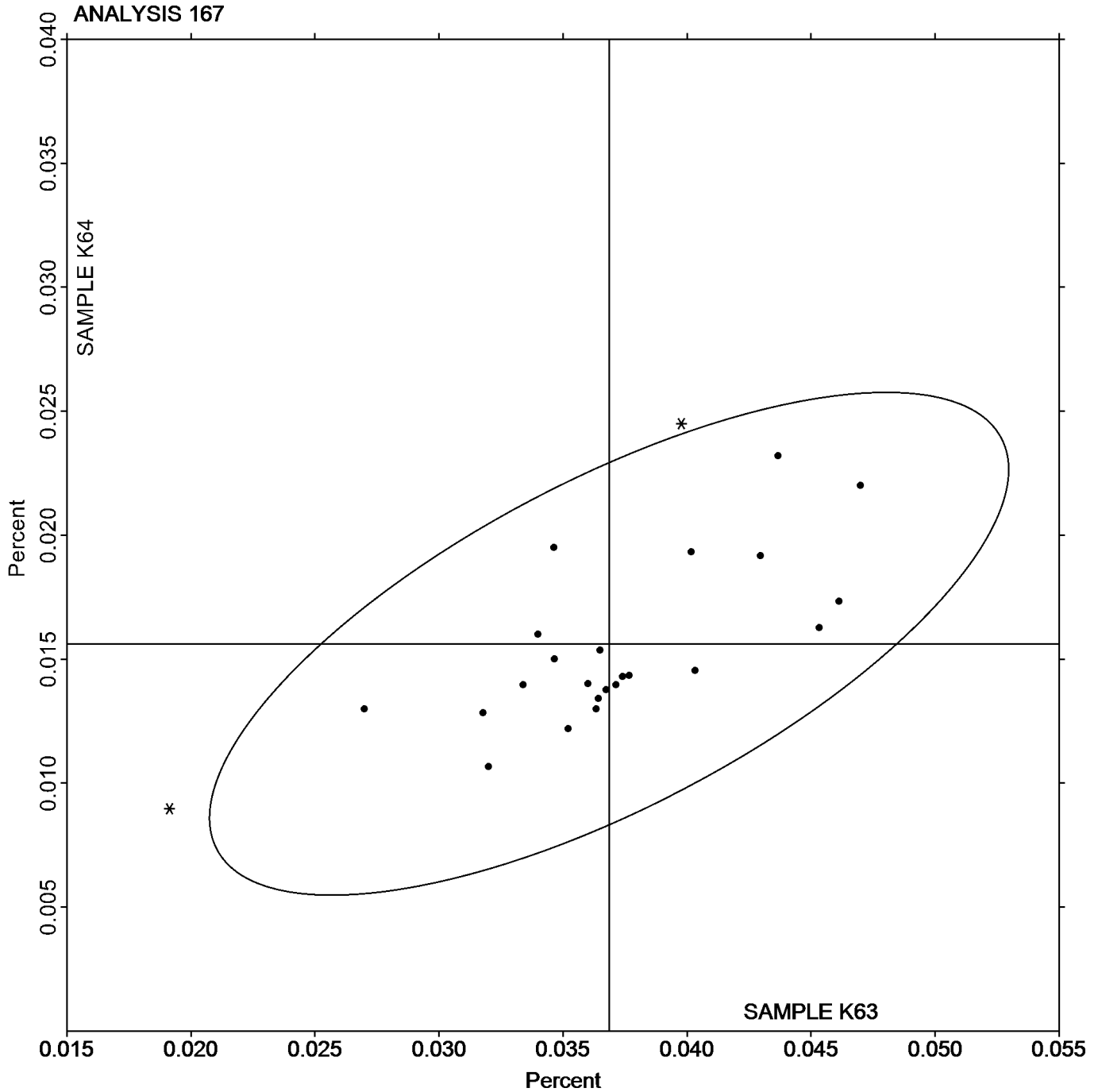


Analysis 167

Copper-based Alloy, Element #8
PHOSPHORUS (P)

SAMPLE K63
0.0369 Percent

SAMPLE K64
0.0156 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 180

Corrosion Resistant Steel, Element #1
CARBON (C)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU	X	0.0739	0.0209	7.80	0.0615	0.0108	3.59	OE
2E7EB7		0.0571	0.0040	1.50	0.0573	0.0066	2.20	OE
4PDTGX		0.0553	0.0023	0.86	0.0530	0.0023	0.76	DR
662M68		0.0523	-0.0007	-0.26	0.0493	-0.0014	-0.46	OE
7EKHMU		0.0545	0.0015	0.55	0.0495	-0.0013	-0.42	OE
8MJ7DY		0.0520	-0.0010	-0.37	0.0477	-0.0030	-0.99	OE
A8XFKA		0.0557	0.0026	0.98	0.0541	0.0034	1.12	OE
AAM2YJ	X	0.0293	-0.0238	-8.87	0.0276	-0.0231	-7.66	OE
AV48RZ		0.0509	-0.0022	-0.81	0.0465	-0.0042	-1.39	CI
D3WJFR		0.0490	-0.0040	-1.49	0.0461	-0.0046	-1.53	CI
DGDLTA		0.0518	-0.0012	-0.46	0.0498	-0.0009	-0.30	XX
DHXQUR		0.0510	-0.0020	-0.76	0.0500	-0.0007	-0.24	OE
DJY8LX		0.0583	0.0053	1.98	0.0543	0.0036	1.20	GD
E2W3CU		0.0510	-0.0020	-0.76	0.0477	-0.0031	-1.01	OE
E3AJRT	X	0.0560	0.0030	1.11	0.0660	0.0153	5.07	OE
E6X79M		0.0537	0.0006	0.23	0.0517	0.0009	0.32	OE
EHF24K		0.0579	0.0048	1.80	0.0550	0.0043	1.42	CI
FA6RX6	*	0.0543	0.0013	0.48	0.0563	0.0056	1.86	CI
FHCKXY	X	0.0323	-0.0207	-7.73	0.0323	-0.0184	-6.10	OE
FYG4J4		0.0500	-0.0030	-1.13	0.0470	-0.0037	-1.23	OE
H9U8GD		0.0484	-0.0047	-1.74	0.0466	-0.0042	-1.38	GD
HF4XNR		0.0580	0.0050	1.85	0.0573	0.0066	2.20	OE
JLHCGM		0.0522	-0.0009	-0.33	0.0500	-0.0007	-0.24	CI
JRWVVN		0.0523	-0.0007	-0.26	0.0500	-0.0007	-0.24	CI
L6PCPE		0.0526	-0.0004	-0.15	0.0506	-0.0002	-0.05	CI
LNMTVW		0.0543	0.0013	0.48	0.0523	0.0016	0.54	OE
N22MDZ		0.0522	-0.0008	-0.31	0.0504	-0.0004	-0.12	OE
NE9NXW	*	0.0607	0.0076	2.85	0.0563	0.0056	1.86	OE
NWQGV9		0.0526	-0.0004	-0.16	0.0515	0.0008	0.26	OE
P4398Q		0.0512	-0.0018	-0.67	0.0495	-0.0013	-0.41	OE
P8QE8F		0.0527	-0.0004	-0.14	0.0523	0.0016	0.54	OE
Q6TNCK		0.0509	-0.0022	-0.81	0.0465	-0.0042	-1.39	CI
QFBEPW		0.0520	-0.0010	-0.39	0.0509	0.0002	0.06	OE
R69B6Y		0.0533	0.0003	0.11	0.0503	-0.0004	-0.13	OE
RPGAUM	X	0.0611	0.0080	3.00	0.0552	0.0045	1.50	OE
RQ6UBQ		0.0585	0.0055	2.04	0.0569	0.0062	2.05	OE
U6JVT2		0.0513	-0.0017	-0.64	0.0483	-0.0024	-0.79	XX
UGAKQL		0.0530	0.0000	-0.01	0.0477	-0.0031	-1.01	OE
VNB89D		0.0532	0.0001	0.05	0.0515	0.0008	0.27	CI
VTJP92		0.0543	0.0013	0.48	0.0523	0.0016	0.54	OE
VYCQP9		0.0519	-0.0012	-0.44	0.0495	-0.0012	-0.39	CO
W9VJFV		0.0530	0.0000	-0.01	0.0507	-0.0001	-0.02	IC
WP2N48		0.0527	-0.0004	-0.14	0.0503	-0.0004	-0.13	OE
WW24TE		0.0480	-0.0051	-1.89	0.0463	-0.0044	-1.45	CO
WXGFD7		0.0518	-0.0013	-0.47	0.0512	0.0004	0.15	GD
XDFXLM		0.0510	-0.0021	-0.77	0.0487	-0.0020	-0.66	CO
XUEYK9		0.0520	-0.0010	-0.39	0.0490	-0.0017	-0.57	CI



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 180

Corrosion Resistant Steel, Element #1
CARBON (C)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
YB92D6		0.0533	0.0003	0.10	0.0513	0.0006	0.20	CI
YTBLLLE		0.0527	-0.0004	-0.14	0.0507	-0.0001	-0.02	CI
YTNDY3		0.0517	-0.0014	-0.51	0.0497	-0.0011	-0.35	OE
YU4RQB		0.0496	-0.0034	-1.28	0.0474	-0.0033	-1.10	CI
Z6LLJJ		0.0564	0.0034	1.27	0.0537	0.0029	0.98	OE
ZMYBDH		0.0533	0.0003	0.11	0.0492	-0.0016	-0.51	CO

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.0530	Percent	0.0507	Percent
Stnd Dev Btwn Labs	0.0027	Percent	0.0030	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 48 of 53 reporting participants

Key to Method Codes Reported by Participants

CI	Combustion / IR	CO	Combustion
DR	Spectrometry - Direct Reading OE (DROES)	GD	Spectrometry - Glow Discharge (GDS)
IC	Spectrometry - Inductively Coupled Plasma (ICP)	OE	Spectrometry - Optical Emission (OES)
XX	Please Indicate Method Used for Current Element		

Comments on Assigned Data Flags for Test #180

- 29PYEU (X) - Data for both samples are high. Possible Systematic Error.
- AAM2YJ (X) - Data for both samples are low. Possible Systematic Error.
- E3AJRT (X) - Data for sample M64 are high. Inconsistent within the determinations of sample M64.
- FHCKXY (X) - Data for both samples are low. Possible Systematic Error.
- RPGAUM (X) - Data for sample M63 are high.



Analysis 180

Corrosion Resistant Steel, Element #1

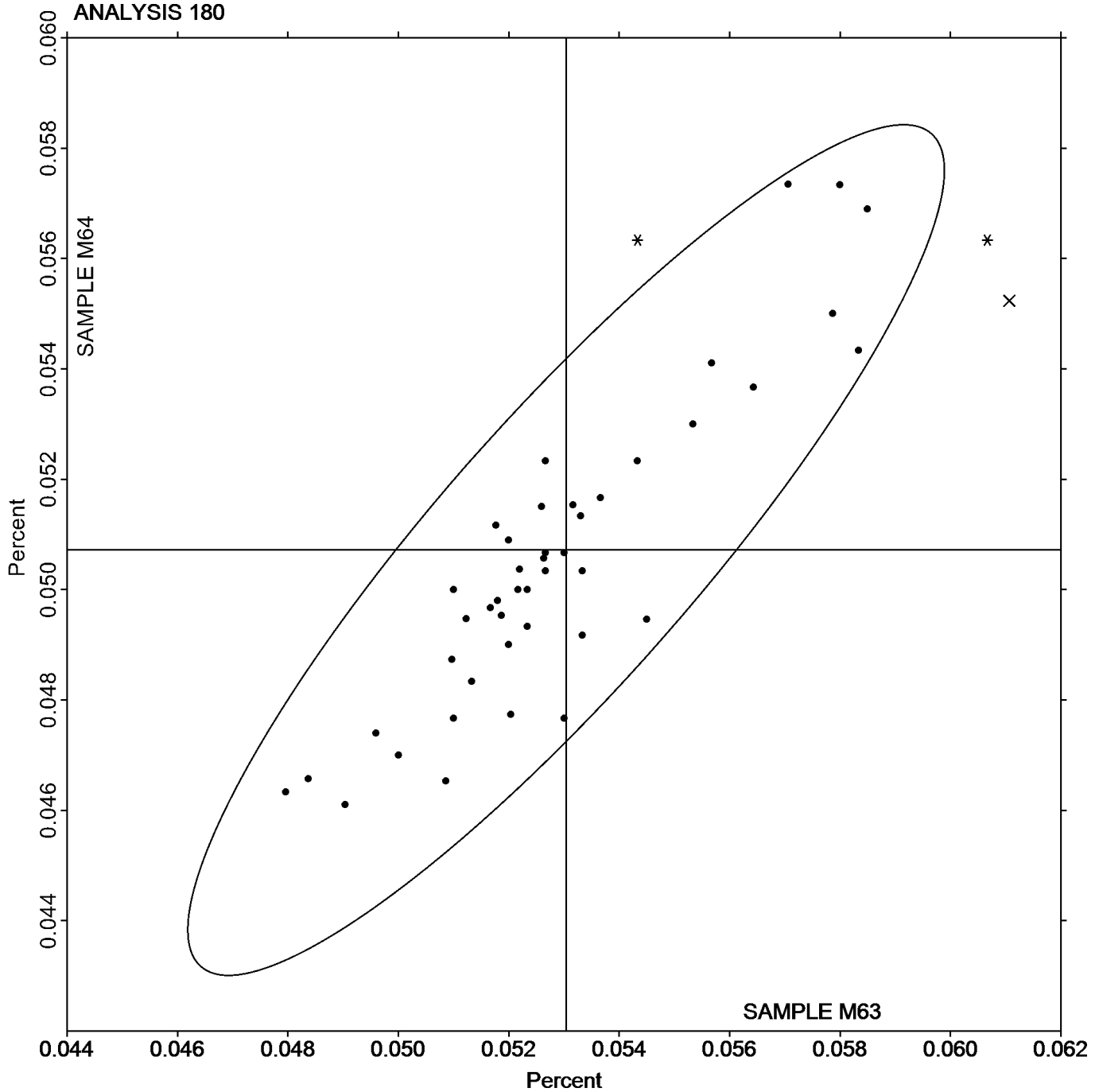
CARBON (C)

SAMPLE M63

0.0530 Percent

SAMPLE M64

0.0507 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 181

Corrosion Resistant Steel, Element #2
MANGANESE (Mn)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		1.800	-0.031	-1.59	1.850	0.002	0.13	OE
2E7EB7		1.839	0.008	0.43	1.868	0.020	1.05	OE
4PDTGX		1.864	0.033	1.72	1.887	0.040	2.08	DR
662M68		1.821	-0.009	-0.49	1.834	-0.014	-0.73	OE
7EKHMU		1.809	-0.022	-1.15	1.827	-0.021	-1.11	OE
8MJ7DY		1.823	-0.008	-0.40	1.845	-0.003	-0.15	OE
A8XFKA		1.855	0.025	1.28	1.876	0.028	1.47	OE
AAM2YJ		1.848	0.017	0.89	1.862	0.015	0.77	OE
AV48RZ		1.816	-0.015	-0.78	1.832	-0.016	-0.83	WD
D3WJFR	*	1.870	0.040	2.05	1.898	0.051	2.66	GD
DGDLTA		1.815	-0.016	-0.81	1.830	-0.018	-0.93	XX
DHXQUR		1.827	-0.004	-0.21	1.843	-0.004	-0.23	OE
DJY8LX	X	1.901	0.070	3.64	1.910	0.062	3.26	GD
E2W3CU		1.863	0.033	1.69	1.873	0.026	1.35	OE
E3AJRT		1.813	-0.018	-0.94	1.834	-0.014	-0.73	OE
E6X79M		1.817	-0.013	-0.69	1.821	-0.027	-1.43	OE
EHF24K		1.833	0.003	0.14	1.859	0.011	0.57	IC
FA6RX6		1.830	-0.001	-0.04	1.837	-0.011	-0.58	OE
FHCKXY	X	1.800	-0.031	-1.59	1.740	-0.108	-5.67	OE
FYG4J4	X	1.750	-0.081	-4.18	1.770	-0.078	-4.09	OE
G3J6EY		1.860	0.029	1.52	1.880	0.032	1.70	XR
GFAW3A		1.821	-0.010	-0.52	1.835	-0.012	-0.65	WD
H9U8GD		1.836	0.005	0.27	1.835	-0.013	-0.69	GD
HF4XNR		1.823	-0.007	-0.38	1.850	0.002	0.12	OE
JLHCGM		1.831	0.000	0.01	1.849	0.001	0.06	IC
JRWVWN		1.824	-0.007	-0.37	1.842	-0.005	-0.29	OE
L6PCPE		1.828	-0.003	-0.14	1.839	-0.009	-0.46	WD
LNMTVW		1.827	-0.004	-0.21	1.843	-0.004	-0.23	OE
N22MDZ		1.790	-0.041	-2.11	1.817	-0.031	-1.64	OE
NE9NXW		1.862	0.032	1.64	1.876	0.028	1.47	OE
NWQGV9		1.817	-0.014	-0.73	1.823	-0.024	-1.29	OE
P4398Q		1.848	0.017	0.89	1.864	0.017	0.87	OE
P8QE8F	*	1.887	0.056	2.90	1.893	0.046	2.40	OE
Q6TNCK		1.811	-0.020	-1.02	1.828	-0.020	-1.04	WD
QFBEPW		1.833	0.003	0.14	1.847	-0.001	-0.06	OE
R69B6Y		1.825	-0.005	-0.28	1.849	0.001	0.06	OE
RPGAUM		1.820	-0.011	-0.56	1.820	-0.028	-1.46	OE
RQ6UBQ		1.803	-0.028	-1.44	1.826	-0.022	-1.14	OE
U6JVT2		1.826	-0.004	-0.23	1.842	-0.005	-0.29	XX
UGAKQL		1.833	0.002	0.10	1.846	-0.002	-0.11	WD
VDNHX7		1.849	0.018	0.96	1.855	0.007	0.38	OE
VNB89D		1.823	-0.007	-0.38	1.826	-0.022	-1.16	WD
VTJP92		1.840	0.009	0.48	1.870	0.022	1.17	OE
VYCQP9		1.818	-0.013	-0.68	1.831	-0.017	-0.90	WD
W9VJFV		1.825	-0.005	-0.28	1.841	-0.006	-0.34	IC
WP2N48		1.853	0.023	1.17	1.870	0.022	1.17	OE
WW24TE		1.818	-0.012	-0.64	1.833	-0.015	-0.80	OE



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 181

Corrosion Resistant Steel, Element #2
MANGANESE (Mn)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
WXGFD7		1.860	0.029	1.52	1.847	-0.001	-0.06	GD
XDFXLM		1.841	0.010	0.52	1.852	0.005	0.24	WD
XUEYK9		1.823	-0.007	-0.38	1.837	-0.011	-0.58	IC
Y2JDQ3		1.813	-0.017	-0.90	1.853	0.006	0.29	AA
YB92D6		1.810	-0.020	-1.06	1.845	-0.003	-0.16	IC
YTBLLLE		1.838	0.007	0.36	1.848	0.000	-0.01	OE
YTNDY3		1.820	-0.011	-0.56	1.834	-0.013	-0.71	OE
YU4RQB		1.851	0.020	1.05	1.864	0.016	0.86	WD
Z6LLJJ		1.820	-0.011	-0.56	1.833	-0.014	-0.76	OE
Z7FA2E		1.825	-0.006	-0.31	1.848	0.001	0.03	OE
ZMYBDH		1.813	-0.017	-0.90	1.860	0.012	0.64	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	1.831	Percent	1.848	Percent
Std Dev Btwn Labs	0.019	Percent	0.019	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 55 of 58 reporting participants

Key to Method Codes Reported by Participants

AA	Spectrometry - Atomic Absorption (AAS)	DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)	IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)	WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified	XX	Please Indicate Method Used for Current Element

Comments on Assigned Data Flags for Test #181

DJY8LX (X) - Data for both samples are high. Possible Systematic Error.

FHCKXY (X) - Data for sample M64 are low.

FYG4J4 (X) - Data for both samples are low. Possible Systematic Error.



Fasteners and Metals Interlaboratory Testing Program

Cycle 128

Analysis 181

4th Qtr 2019

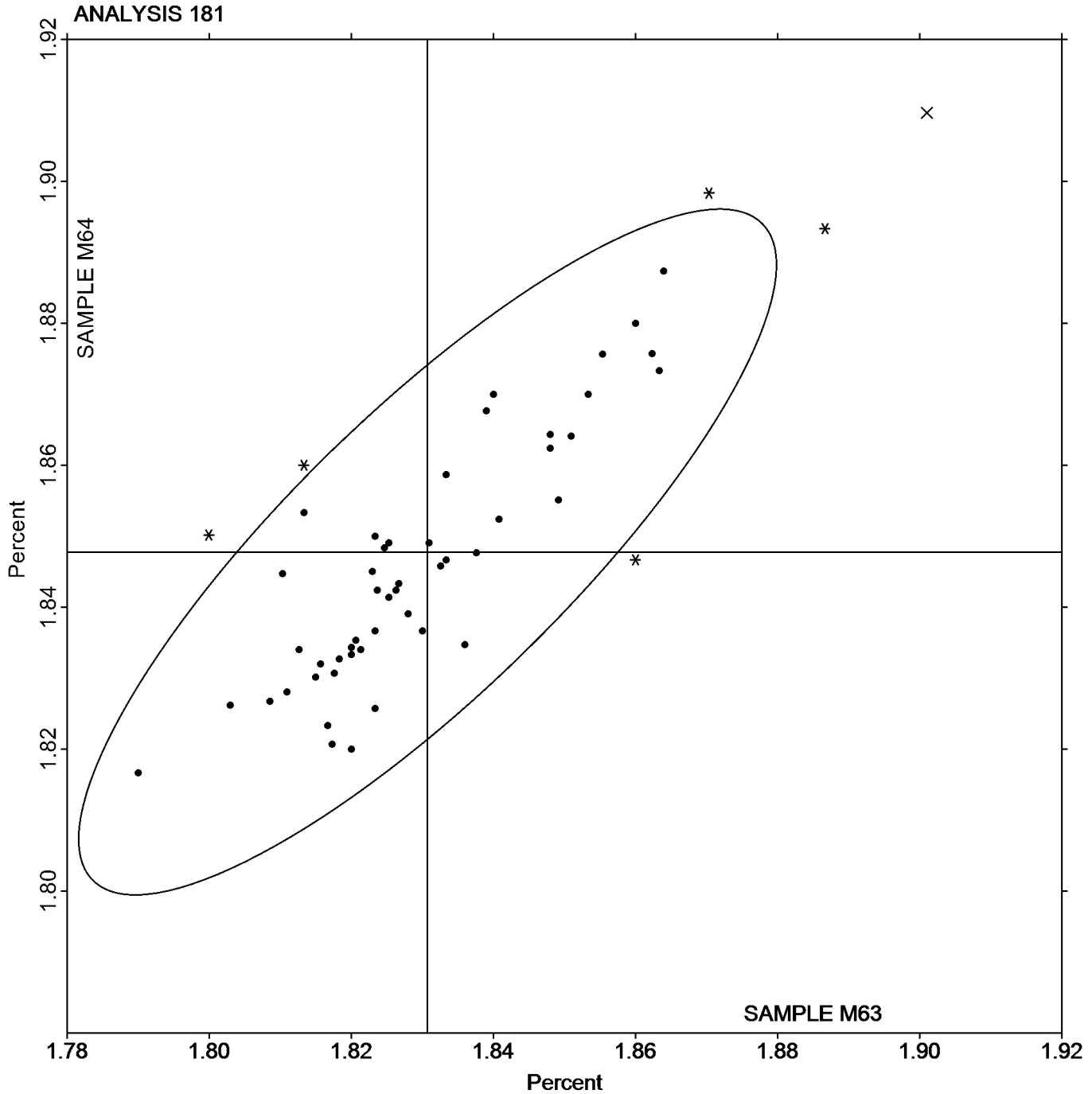
Corrosion Resistant Steel, Element #2
MANGANESE (Mn)

SAMPLE M63

1.831 Percent

SAMPLE M64

1.848 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 182

Corrosion Resistant Steel, Element #3
PHOSPHORUS (P)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU	X	0.0255	-0.0047	-2.06	0.0374	0.0007	0.27	OE
2E7EB7		0.0272	-0.0031	-1.34	0.0333	-0.0034	-1.32	OE
4PDTGX		0.0320	0.0017	0.75	0.0387	0.0019	0.74	DR
662M68		0.0293	-0.0010	-0.44	0.0354	-0.0014	-0.53	OE
7EKHMU		0.0298	-0.0005	-0.20	0.0373	0.0005	0.20	OE
8MJ7DY		0.0288	-0.0014	-0.63	0.0373	0.0005	0.20	OE
A8XFKA	X	0.0455	0.0152	6.63	0.0542	0.0175	6.69	OE
AAM2YJ		0.0280	-0.0022	-0.97	0.0330	-0.0037	-1.42	OE
AV48RZ		0.0304	0.0002	0.07	0.0367	0.0000	0.00	WD
D3WJFR		0.0296	-0.0007	-0.31	0.0357	-0.0011	-0.41	GD
DGDLTA	*	0.0258	-0.0044	-1.93	0.0340	-0.0027	-1.05	XX
DHXQUR		0.0293	-0.0009	-0.41	0.0360	-0.0007	-0.28	OE
DJY8LX		0.0323	0.0021	0.90	0.0377	0.0009	0.36	GD
E2W3CU		0.0297	-0.0006	-0.26	0.0363	-0.0004	-0.16	OE
E3AJRT		0.0266	-0.0037	-1.60	0.0323	-0.0045	-1.72	OE
E6X79M		0.0314	0.0011	0.49	0.0382	0.0015	0.56	OE
EHF24K		0.0321	0.0018	0.78	0.0383	0.0016	0.60	IC
FA6RX6		0.0297	-0.0005	-0.24	0.0363	-0.0005	-0.18	OE
FYG4J4		0.0340	0.0037	1.62	0.0410	0.0043	1.64	OE
GFAW3A		0.0283	-0.0019	-0.84	0.0340	-0.0027	-1.05	WD
H9U8GD		0.0275	-0.0028	-1.21	0.0354	-0.0013	-0.51	GD
HF4XNR		0.0297	-0.0006	-0.26	0.0357	-0.0011	-0.41	OE
JLHCGM		0.0300	-0.0003	-0.12	0.0370	0.0003	0.10	IC
JRWVVN		0.0302	-0.0001	-0.03	0.0360	-0.0007	-0.28	OE
L6PCPE		0.0303	0.0000	0.00	0.0371	0.0003	0.13	WD
LNMTVW		0.0341	0.0038	1.67	0.0422	0.0054	2.08	OE
N22MDZ		0.0263	-0.0039	-1.71	0.0336	-0.0032	-1.22	OE
NE9NXW		0.0323	0.0021	0.90	0.0397	0.0029	1.12	OE
NWQGV9	*	0.0375	0.0072	3.14	0.0446	0.0078	3.00	OE
P4398Q		0.0351	0.0048	2.10	0.0428	0.0060	2.31	OE
P8QE8F		0.0303	0.0001	0.03	0.0367	-0.0001	-0.03	OE
Q6TNCK		0.0305	0.0002	0.08	0.0366	-0.0001	-0.05	WD
QFBEPW		0.0304	0.0001	0.05	0.0382	0.0015	0.56	OE
R69B6Y		0.0303	0.0001	0.03	0.0358	-0.0010	-0.37	OE
RPGAUM	X	0.0327	0.0025	1.07	0.0462	0.0095	3.63	OE
RQ6UBQ		0.0295	-0.0007	-0.32	0.0364	-0.0003	-0.13	OE
U6JVT2		0.0271	-0.0032	-1.38	0.0327	-0.0040	-1.54	XX
UGAKQL		0.0310	0.0008	0.33	0.0365	-0.0003	-0.10	WD
VDNHX7		0.0329	0.0026	1.14	0.0392	0.0025	0.94	OE
VNB89D		0.0307	0.0004	0.17	0.0369	0.0001	0.05	WD
VTJP92		0.0320	0.0017	0.75	0.0407	0.0039	1.51	OE
VYCQP9		0.0299	-0.0003	-0.15	0.0354	-0.0013	-0.51	WD
W9VJFV		0.0299	-0.0003	-0.15	0.0353	-0.0014	-0.55	IC
WP2N48		0.0307	0.0004	0.17	0.0363	-0.0004	-0.16	OE
WW24TE		0.0304	0.0001	0.05	0.0365	-0.0002	-0.09	OE
WXGFD7		0.0312	0.0009	0.39	0.0356	-0.0011	-0.44	GD
XDFXLM		0.0324	0.0021	0.93	0.0388	0.0021	0.79	WD



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 182

Corrosion Resistant Steel, Element #3
PHOSPHORUS (P)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XUEYK9		0.0280	-0.0023	-0.99	0.0317	-0.0051	-1.95	IC
YB92D6		0.0333	0.0031	1.33	0.0393	0.0026	1.00	IC
YTBLLLE		0.0294	-0.0009	-0.38	0.0360	-0.0008	-0.30	OE
YTNDY3		0.0309	0.0006	0.27	0.0371	0.0004	0.15	OE
YU4RQB		0.0287	-0.0016	-0.70	0.0341	-0.0026	-1.01	WD
Z6LLJJ		0.0267	-0.0036	-1.57	0.0360	-0.0007	-0.28	OE
ZMYBDH	*	0.0307	0.0004	0.17	0.0323	-0.0044	-1.69	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.0303	Percent	0.0367	Percent
Stnd Dev Btwn Labs	0.0023	Percent	0.0026	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 50 of 54 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #182

29PYEU (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample M64.

A8XFKA (X) - Data for both samples are high. Possible Systematic Error.

RPGAUM (X) - Data for sample M64 are high. Inconsistent within the determinations of both samples.



Fasteners and Metals Interlaboratory Testing Program

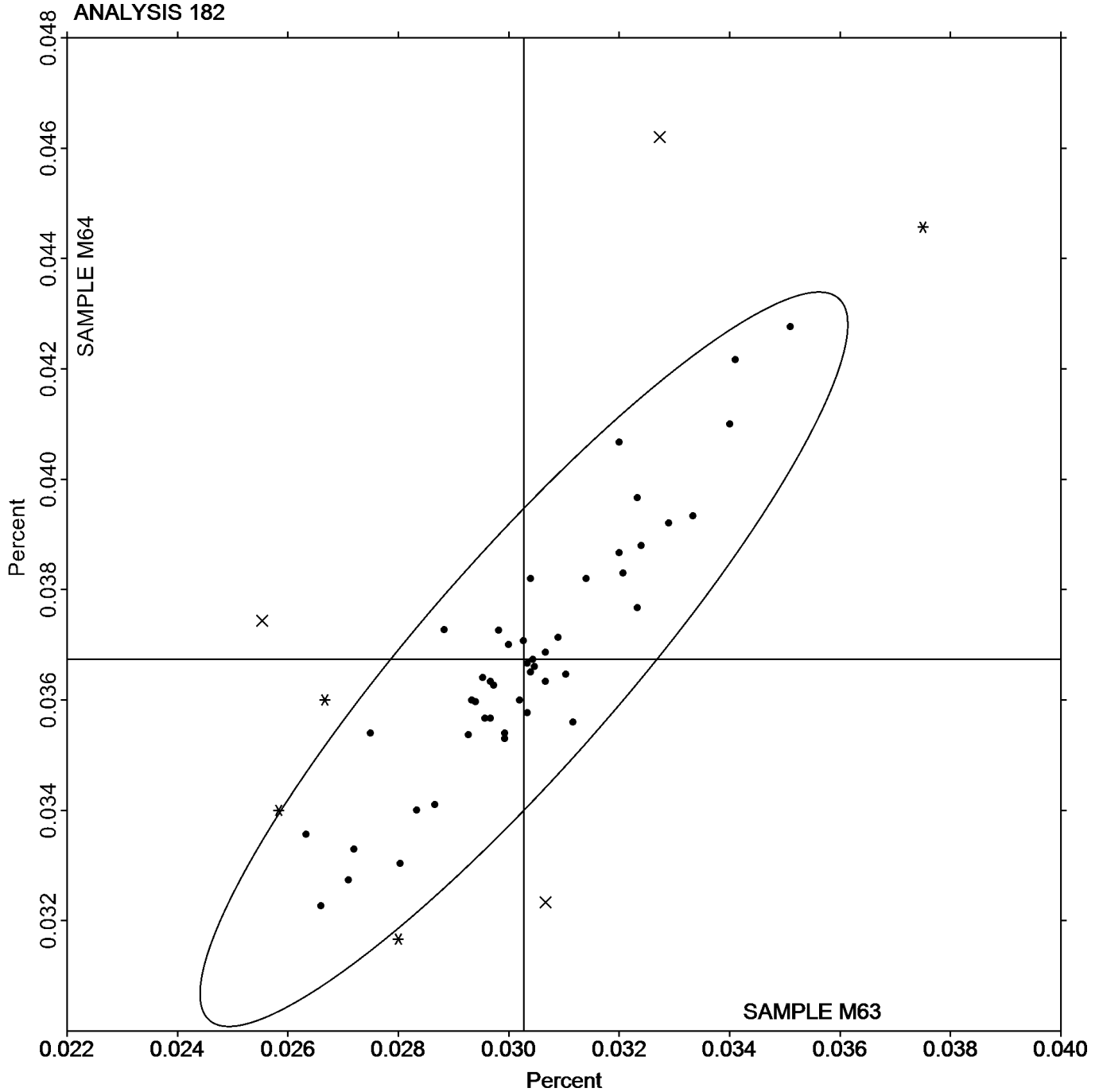
Cycle 128
4th Qtr 2019

Analysis 182

Corrosion Resistant Steel, Element #3
PHOSPHORUS (P)

SAMPLE M63
0.0303 Percent

SAMPLE M64
0.0367 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 183

Corrosion Resistant Steel, Element #4
SULFUR (S)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		0.0219	-0.0057	-2.04	0.0239	-0.0019	-0.78	OE
2E7EB7		0.0232	-0.0044	-1.57	0.0224	-0.0034	-1.37	OE
4PDTGX		0.0273	-0.0003	-0.10	0.0257	-0.0001	-0.06	DR
662M68	X	0.0274	-0.0003	-0.09	0.0354	0.0096	3.86	OE
7EKHMU		0.0286	0.0010	0.34	0.0254	-0.0004	-0.16	OE
8MJ7DY		0.0299	0.0023	0.83	0.0261	0.0003	0.12	OE
A8XFKA		0.0272	-0.0004	-0.15	0.0265	0.0007	0.29	OE
AAM2YJ		0.0235	-0.0041	-1.47	0.0221	-0.0037	-1.51	OE
AV48RZ		0.0249	-0.0027	-0.98	0.0224	-0.0034	-1.39	CI
D3WJFR		0.0292	0.0016	0.57	0.0274	0.0016	0.63	CI
DGDLTA		0.0302	0.0026	0.94	0.0277	0.0019	0.78	XX
DHXQUR		0.0287	0.0010	0.38	0.0290	0.0032	1.29	OE
DJY8LX		0.0280	0.0004	0.14	0.0260	0.0002	0.08	GD
E2W3CU		0.0257	-0.0020	-0.70	0.0227	-0.0031	-1.27	OE
E3AJRT		0.0236	-0.0040	-1.44	0.0235	-0.0023	-0.94	OE
E6X79M		0.0266	-0.0010	-0.35	0.0251	-0.0007	-0.29	OE
EHF24K		0.0305	0.0029	1.05	0.0284	0.0026	1.05	CI
FA6RX6		0.0247	-0.0029	-1.05	0.0223	-0.0035	-1.43	CI
FYG4J4	X	0.0170	-0.0106	-3.81	0.0153	-0.0105	-4.23	OE
H9U8GD		0.0266	-0.0011	-0.38	0.0247	-0.0011	-0.43	GD
HF4XNR		0.0263	-0.0013	-0.46	0.0257	-0.0001	-0.06	OE
JLHCGM		0.0280	0.0003	0.12	0.0256	-0.0002	-0.08	CI
JRWVVN		0.0290	0.0014	0.49	0.0260	0.0002	0.08	CI
L6PCPE		0.0279	0.0003	0.10	0.0260	0.0002	0.06	CI
LNMTVW		0.0272	-0.0004	-0.15	0.0259	0.0001	0.02	OE
N22MDZ		0.0246	-0.0030	-1.07	0.0234	-0.0024	-0.97	OE
NE9NXW		0.0282	0.0006	0.21	0.0271	0.0013	0.54	OE
NWQGV9		0.0331	0.0054	1.96	0.0281	0.0023	0.93	OE
P4398Q		0.0315	0.0039	1.39	0.0287	0.0029	1.16	OE
P8QE8F		0.0282	0.0006	0.22	0.0262	0.0004	0.15	OE
Q6TNCK		0.0249	-0.0027	-0.98	0.0224	-0.0034	-1.39	CI
QFBEPW		0.0271	-0.0005	-0.18	0.0227	-0.0031	-1.25	OE
R69B6Y		0.0259	-0.0018	-0.63	0.0244	-0.0014	-0.58	OE
RPGAUM	X	0.0382	0.0105	3.79	0.0383	0.0125	5.03	OE
RQ6UBQ		0.0324	0.0048	1.72	0.0305	0.0047	1.90	OE
U6JVT2		0.0347	0.0070	2.53	0.0317	0.0059	2.37	XX
UGAKQL	X	0.0247	-0.0030	-1.06	0.0170	-0.0088	-3.57	WD
VNB89D		0.0267	-0.0009	-0.33	0.0248	-0.0010	-0.41	CI
VTJP92		0.0287	0.0010	0.38	0.0291	0.0033	1.33	OE
VYCQP9		0.0272	-0.0005	-0.16	0.0240	-0.0018	-0.72	CO
W9VJFV		0.0263	-0.0013	-0.46	0.0259	0.0001	0.05	IC
WP2N48		0.0290	0.0014	0.49	0.0250	-0.0008	-0.33	OE
WW24TE	*	0.0346	0.0070	2.51	0.0327	0.0069	2.80	CO
WXGFD7		0.0250	-0.0027	-0.95	0.0247	-0.0011	-0.43	GD
XDFXLM		0.0260	-0.0016	-0.58	0.0251	-0.0007	-0.28	CO
XUEYK9		0.0293	0.0017	0.61	0.0253	-0.0005	-0.19	CI
YB92D6		0.0260	-0.0016	-0.57	0.0231	-0.0027	-1.08	CI



Fasteners and Metals Interlaboratory Testing Program

**Cycle 128
4th Qtr 2019**

Analysis 183

**Corrosion Resistant Steel, Element #4
SULFUR (S)**

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
YTBLLLE		0.0263	-0.0013	-0.47	0.0247	-0.0011	-0.45	CI
YTNDY3		0.0313	0.0036	1.31	0.0298	0.0040	1.60	OE
YU4RQB		0.0271	-0.0006	-0.20	0.0252	-0.0006	-0.26	CI
Z6LLJJ		0.0270	-0.0006	-0.22	0.0273	0.0015	0.62	OE
Z7FA2E		0.0293	0.0016	0.59	0.0279	0.0021	0.85	CO
ZMYBDH		0.0243	-0.0033	-1.19	0.0244	-0.0014	-0.57	CO

Summary Statistics								
		Sample M63			Sample M64			
Grand Means		0.0276	Percent		0.0258	Percent		
Stnd Dev Btwn Labs		0.0028	Percent		0.0025	Percent		

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 49 of 53 reporting participants

Key to Method Codes Reported by Participants

- CI Combustion / IR
- DR Spectrometry - Direct Reading OE (DROES)
- IC Spectrometry - Inductively Coupled Plasma (ICP)
- WD X-Ray Fluorescence - Wavelength Dispersive (WDX)
- CO Combustion
- GD Spectrometry - Glow Discharge (GDS)
- OE Spectrometry - Optical Emission (OES)
- XX Please Indicate Method Used for Current Element

Comments on Assigned Data Flags for Test #183

- 662M68 (X) - Data for sample M64 are high.
- FYG4J4 (X) - Data for both samples are low. Possible Systematic Error.
- RPGAUM (X) - Data for both samples are high. Possible Systematic Error.
- UGAKQL (X) - Data for sample M64 are low.



Fasteners and Metals Interlaboratory Testing Program

Cycle 128

Analysis 183

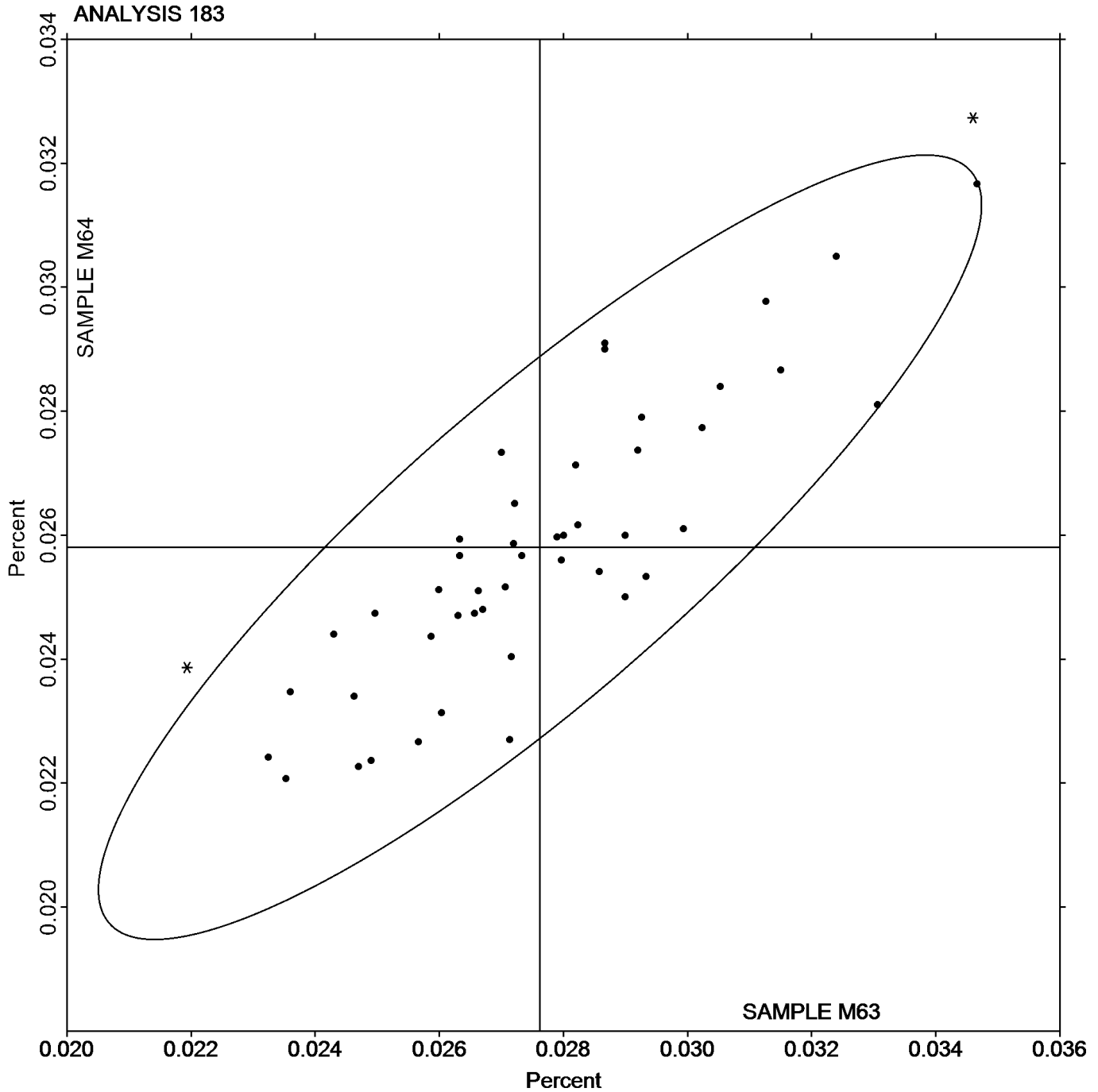
4th Qtr 2019

Corrosion Resistant Steel, Element #4

SULFUR (S)

SAMPLE M63
0.0276 Percent

SAMPLE M64
0.0258 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 184

Corrosion Resistant Steel, Element #5
SILICON (Si)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		0.3250	0.0100	1.00	0.3284	0.0100	0.99	OE
2E7EB7		0.3120	-0.0030	-0.30	0.3208	0.0024	0.23	OE
4PDTGX		0.3177	0.0027	0.27	0.3217	0.0033	0.32	DR
662M68		0.3120	-0.0030	-0.30	0.3133	-0.0051	-0.50	OE
7EKHMU		0.3188	0.0038	0.38	0.3242	0.0058	0.58	OE
8MJ7DY	X	0.4292	0.1142	11.38	0.4326	0.1142	11.30	OE
A8XFKA		0.3092	-0.0057	-0.57	0.3142	-0.0042	-0.42	OE
AAM2YJ	X	0.2767	-0.0383	-3.82	0.2817	-0.0367	-3.64	OE
AV48RZ		0.3023	-0.0126	-1.26	0.3057	-0.0127	-1.26	WD
D3WJFR		0.3090	-0.0060	-0.59	0.3127	-0.0057	-0.57	GD
DGDLTA		0.3413	0.0264	2.63	0.3413	0.0229	2.27	XX
DHXQUR		0.3100	-0.0050	-0.49	0.3167	-0.0017	-0.17	OE
DJY8LX		0.3173	0.0024	0.24	0.3297	0.0113	1.12	GD
E2W3CU		0.3080	-0.0070	-0.69	0.3103	-0.0081	-0.80	OE
E3AJRT		0.3280	0.0130	1.30	0.3320	0.0136	1.35	OE
E6X79M		0.3263	0.0114	1.13	0.3283	0.0099	0.98	OE
EHF24K		0.3070	-0.0080	-0.79	0.3090	-0.0094	-0.93	IC
FA6RX6		0.3090	-0.0060	-0.59	0.3113	-0.0071	-0.70	OE
FHCKXY		0.3250	0.0100	1.00	0.3350	0.0166	1.64	OE
FYG4J4		0.3200	0.0050	0.50	0.3300	0.0116	1.15	OE
G3J6EY	X	0.3913	0.0764	7.61	0.4087	0.0903	8.93	XR
GFAW3A		0.2983	-0.0166	-1.66	0.3017	-0.0167	-1.66	WD
H9U8GD		0.3169	0.0020	0.20	0.3176	-0.0008	-0.08	GD
HF4XNR	X	0.3023	-0.0126	-1.26	0.2953	-0.0231	-2.28	OE
JLHCGM		0.3100	-0.0050	-0.49	0.3140	-0.0044	-0.44	GR
JRWWVN		0.3170	0.0020	0.20	0.3220	0.0036	0.36	OE
L6PCPE		0.3173	0.0024	0.24	0.3213	0.0029	0.29	WD
LNMTVW		0.3040	-0.0110	-1.09	0.3113	-0.0071	-0.70	OE
N22MDZ		0.2993	-0.0156	-1.56	0.3030	-0.0154	-1.52	OE
NE9NXW		0.3317	0.0167	1.66	0.3327	0.0143	1.41	OE
NWQGV9		0.2913	-0.0236	-2.35	0.2943	-0.0241	-2.38	OE
P4398Q		0.3193	0.0044	0.44	0.3223	0.0039	0.39	OE
P8QE8F	*	0.3400	0.0250	2.50	0.3400	0.0216	2.14	OE
Q6TNCK		0.3083	-0.0066	-0.66	0.3103	-0.0081	-0.80	WD
QFBEPW	*	0.3110	-0.0040	-0.39	0.3053	-0.0131	-1.29	OE
R69B6Y		0.3183	0.0034	0.34	0.3180	-0.0004	-0.04	OE
RPGAUM		0.3130	-0.0020	-0.20	0.3200	0.0016	0.16	OE
RQ6UBQ		0.3108	-0.0042	-0.42	0.3162	-0.0022	-0.22	OE
U6JVT2	X	0.3197	0.0047	0.47	0.3107	-0.0077	-0.77	XX
UGAKQL		0.2979	-0.0171	-1.70	0.3029	-0.0155	-1.53	WD
VDNHX7		0.3143	-0.0007	-0.07	0.3150	-0.0034	-0.33	OE
VNB89D		0.3107	-0.0043	-0.43	0.3107	-0.0077	-0.77	WD
VTJP92	X	0.2400	-0.0750	-7.47	0.2433	-0.0751	-7.43	OE
VYCQP9		0.3253	0.0103	1.03	0.3262	0.0078	0.77	WD
W9VJFV		0.3167	0.0017	0.17	0.3187	0.0003	0.03	IC
WP2N48		0.3040	-0.0110	-1.09	0.3077	-0.0107	-1.06	OE
WW24TE		0.3157	0.0007	0.07	0.3177	-0.0007	-0.07	OE



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 184

Corrosion Resistant Steel, Element #5
SILICON (Si)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
WXGFD7		0.3230	0.0080	0.80	0.3240	0.0056	0.55	GD
XDFXLM		0.3111	-0.0038	-0.38	0.3150	-0.0034	-0.34	WD
XUEYK9		0.3223	0.0074	0.73	0.3290	0.0106	1.05	IC
YB92D6	X	0.3953	0.0804	8.01	0.3930	0.0746	7.38	IC
YTBLLLE		0.3187	0.0037	0.37	0.3190	0.0006	0.06	OE
YTNDY3		0.3243	0.0094	0.93	0.3267	0.0083	0.82	OE
YU4RQB		0.3126	-0.0024	-0.24	0.3161	-0.0023	-0.23	WD
Z6LLJJ		0.3080	-0.0070	-0.69	0.3113	-0.0071	-0.70	OE
Z7FA2E		0.3240	0.0090	0.90	0.3270	0.0086	0.85	OE
ZMYBDH	*	0.3350	0.0200	2.00	0.3160	-0.0024	-0.24	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.3150	Percent	0.3184	Percent
Std Dev Btwn Labs	0.0100	Percent	0.0101	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 49 of 57 reporting participants

Key to Method Codes Reported by Participants

DR	Spectrometry - Direct Reading OE (DROES)	GD	Spectrometry - Glow Discharge (GDS)
GR	Gravimetry	IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)	WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified	XX	Please Indicate Method Used for Current Element

Comments on Assigned Data Flags for Test #184

- 8MJ7DY (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- AAM2YJ (X) - Data for both samples are low. Possible Systematic Error.
- G3J6EY (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- HF4XNR (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample M64.
- U6JVT2 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample M63.
- VTJP92 (X) - Data for both samples are low. Possible Systematic Error.
- YB92D6 (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample M63.



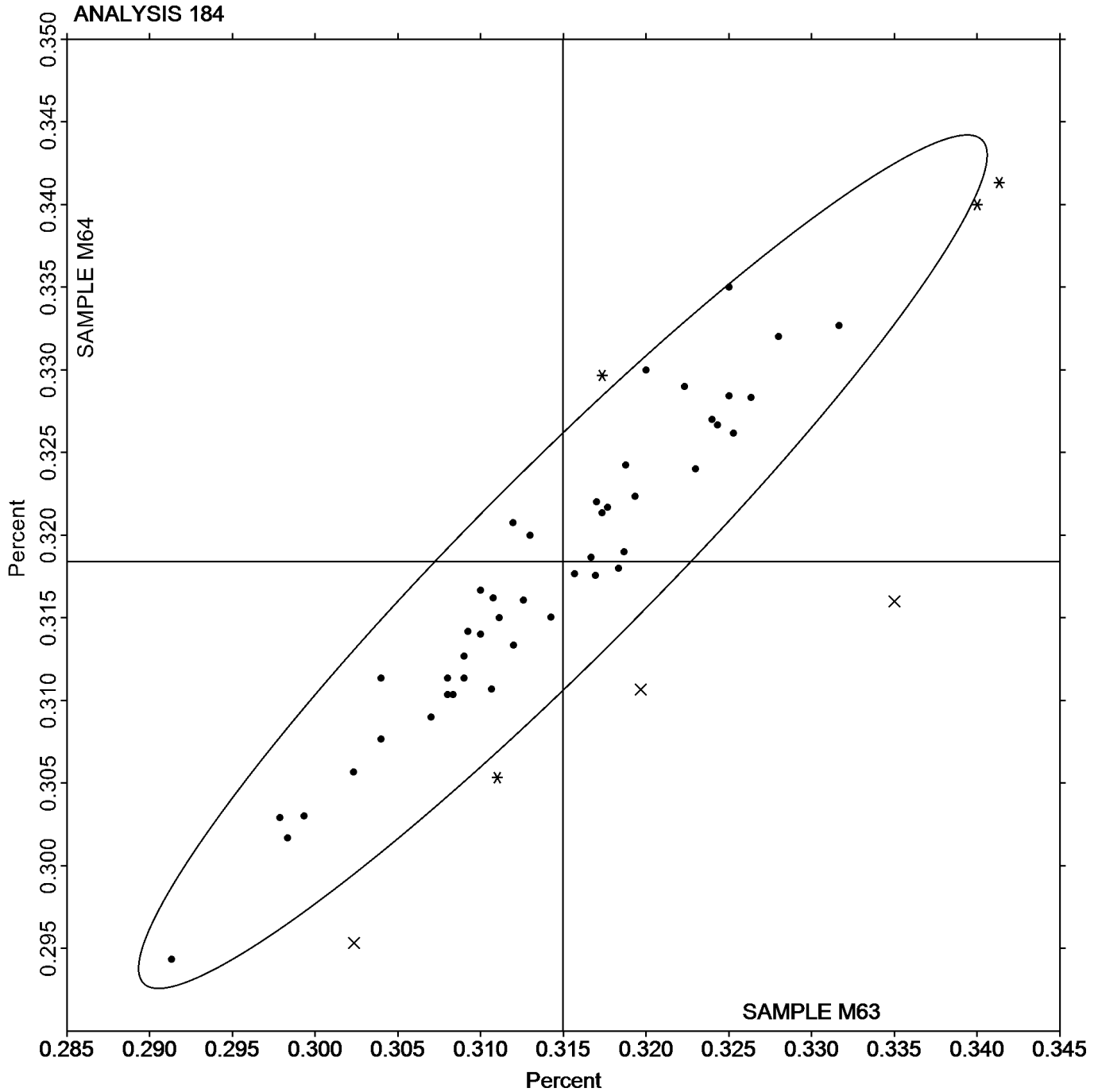
Analysis 184

Corrosion Resistant Steel, Element #5

SILICON (Si)

SAMPLE M63
0.3150 Percent

SAMPLE M64
0.3184 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 185

Corrosion Resistant Steel, Element #6
COBALT (Co)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		0.1669	-0.0091	-2.44	0.1517	-0.0086	-2.38	OE
2E7EB7		0.1762	0.0002	0.04	0.1594	-0.0009	-0.25	OE
4PDTGX		0.1790	0.0030	0.80	0.1627	0.0024	0.65	DR
662M68		0.1783	0.0023	0.62	0.1620	0.0017	0.47	OE
7EKHMU	X	0.1592	-0.0168	-4.49	0.1469	-0.0134	-3.69	OE
8MJ7DY		0.1753	-0.0007	-0.18	0.1630	0.0027	0.75	OE
A8XFKA		0.1726	-0.0034	-0.91	0.1585	-0.0018	-0.49	OE
AAM2YJ		0.1777	0.0016	0.44	0.1617	0.0014	0.38	OE
AV48RZ		0.1723	-0.0037	-0.99	0.1570	-0.0033	-0.91	WD
D3WJFR		0.1747	-0.0014	-0.36	0.1603	0.0000	0.01	GD
DGDLTA		0.1783	0.0023	0.62	0.1619	0.0016	0.44	XX
DHXQUR		0.1800	0.0040	1.06	0.1600	-0.0003	-0.08	OE
DJY8LX		0.1803	0.0043	1.15	0.1667	0.0064	1.76	GD
E2W3CU		0.1720	-0.0040	-1.07	0.1560	-0.0043	-1.18	OE
E3AJRT		0.1717	-0.0044	-1.16	0.1550	-0.0053	-1.46	OE
E6X79M		0.1750	-0.0010	-0.27	0.1613	0.0010	0.29	OE
EHF24K		0.1717	-0.0044	-1.16	0.1590	-0.0013	-0.36	IC
FA6RX6		0.1790	0.0030	0.80	0.1627	0.0024	0.65	OE
FHCKXY		0.1810	0.0050	1.33	0.1650	0.0047	1.30	OE
FYG4J4	X	0.1700	-0.0060	-1.61	0.1500	-0.0103	-2.84	OE
GFAW3A		0.1787	0.0026	0.71	0.1640	0.0037	1.02	WD
H9U8GD	X	0.2730	0.0970	25.93	0.2547	0.0944	26.00	GD
JLHCGM		0.1763	0.0003	0.08	0.1617	0.0014	0.38	IC
JRWVVN		0.1800	0.0040	1.06	0.1643	0.0040	1.11	OE
L6PCPE		0.1786	0.0026	0.70	0.1626	0.0023	0.64	WD
LNMTVW		0.1737	-0.0024	-0.63	0.1583	-0.0020	-0.54	OE
N22MDZ		0.1723	-0.0037	-0.99	0.1560	-0.0043	-1.18	OE
NWQGV9		0.1707	-0.0054	-1.43	0.1540	-0.0063	-1.73	OE
P4398Q		0.1763	0.0003	0.08	0.1597	-0.0006	-0.17	OE
P8QE8F	X	0.1900	0.0140	3.74	0.1700	0.0097	2.67	OE
Q6TNCK		0.1753	-0.0007	-0.18	0.1593	-0.0010	-0.26	WD
QFBEPW		0.1750	-0.0010	-0.27	0.1590	-0.0013	-0.36	OE
R69B6Y		0.1810	0.0050	1.33	0.1640	0.0037	1.02	OE
RPGAUM		0.1843	0.0083	2.22	0.1687	0.0084	2.31	OE
RQ6UBQ		0.1742	-0.0019	-0.49	0.1592	-0.0011	-0.30	OE
U6JVT2		0.1700	-0.0060	-1.61	0.1547	-0.0056	-1.55	XX
UGAKQL		0.1793	0.0033	0.89	0.1623	0.0020	0.54	WD
VDNHX7		0.1680	-0.0081	-2.15	0.1526	-0.0077	-2.13	XX
VNB89D		0.1783	0.0023	0.62	0.1613	0.0010	0.29	WD
VTJP92	X	0.1617	-0.0144	-3.84	0.1463	-0.0140	-3.85	OE
YVCQP9		0.1756	-0.0004	-0.10	0.1597	-0.0006	-0.16	WD
W9VJFV		0.1793	0.0033	0.89	0.1650	0.0047	1.30	IC
WP2N48		0.1763	0.0003	0.08	0.1597	-0.0006	-0.17	OE
WW24TE		0.1737	-0.0024	-0.63	0.1583	-0.0020	-0.54	OE
WXGFD7		0.1797	0.0036	0.98	0.1660	0.0057	1.57	GD
XDFXLM		0.1781	0.0021	0.57	0.1621	0.0018	0.49	WD
XUEYK9		0.1777	0.0016	0.44	0.1580	-0.0023	-0.63	IC



Fasteners and Metals Interlaboratory Testing Program

**Cycle 128
4th Qtr 2019**

Analysis 185

**Corrosion Resistant Steel, Element #6
COBALT (Co)**

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
YTBLLLE		0.1750	-0.0010	-0.27	0.1590	-0.0013	-0.36	OE
YTNDY3		0.1800	0.0040	1.06	0.1637	0.0034	0.93	OE
YU4RQB		0.1770	0.0010	0.26	0.1619	0.0016	0.44	WD
Z6LLJJ		0.1733	-0.0027	-0.72	0.1560	-0.0043	-1.18	OE
Z7FA2E		0.1790	0.0030	0.80	0.1613	0.0010	0.29	OE
ZMYBDH		0.1700	-0.0060	-1.61	0.1580	-0.0023	-0.63	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.1760	Percent	0.1603	Percent
Stnd Dev Btwn Labs	0.0037	Percent	0.0036	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 48 of 53 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #185

- 7EKHMU (X) - Data for both samples are low. Possible Systematic Error.
- FYG4J4 (X) - Data for sample M64 are low.
- H9U8GD (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample M64.
- P8QE8F (X) - Data for sample M63 are high.
- VTJP92 (X) - Data for both samples are low. Possible Systematic Error.

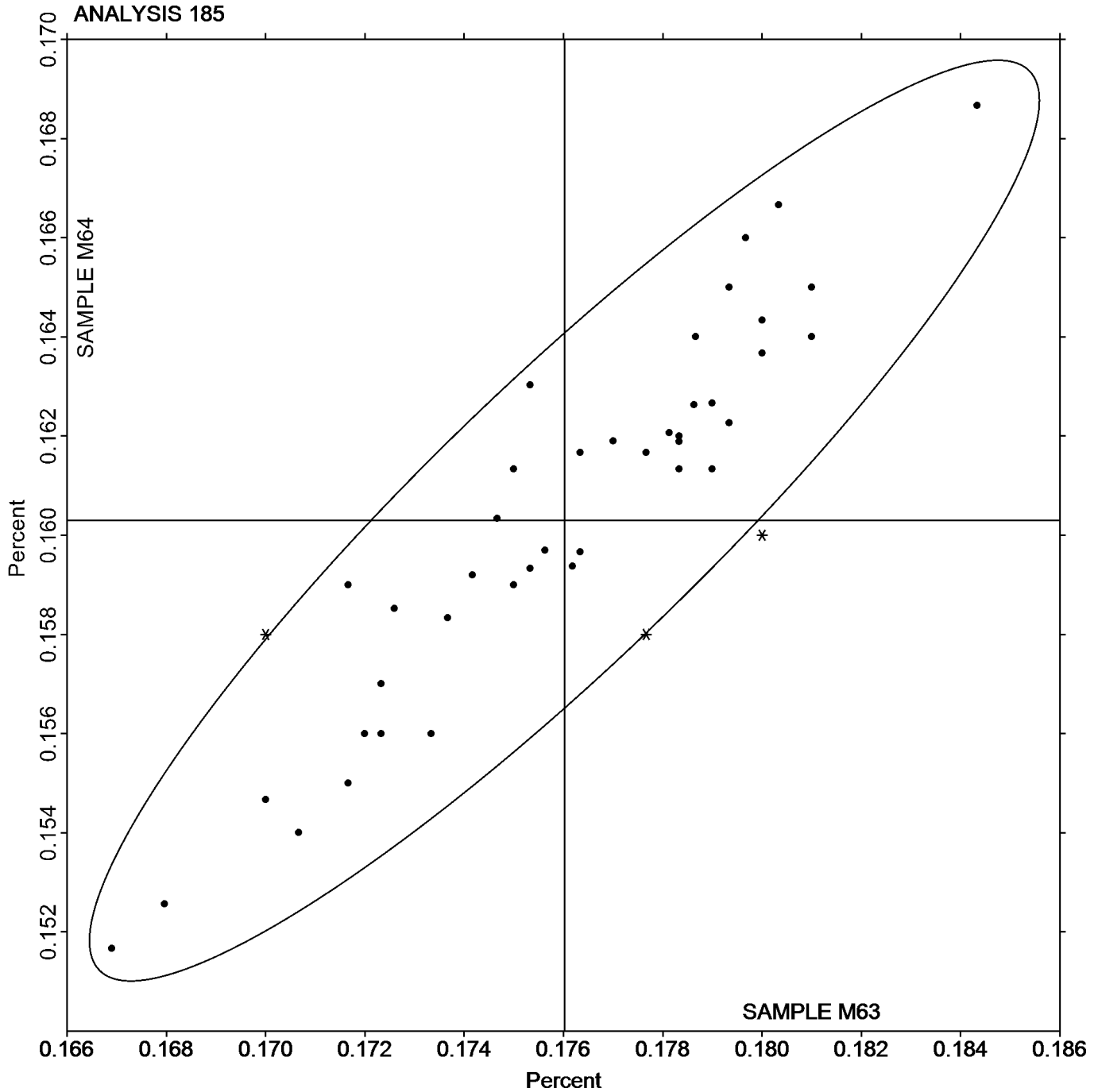


Analysis 185

Corrosion Resistant Steel, Element #6
COBALT (Co)

SAMPLE M63
0.1760 Percent

SAMPLE M64
0.1603 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 186

Corrosion Resistant Steel, Element #7
NICKEL (Ni)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU	*	8.424	0.176	2.14	8.299	0.045	0.51	OE
2E7EB7		8.277	0.029	0.36	8.250	-0.004	-0.05	OE
4PDTGX		8.267	0.019	0.24	8.259	0.005	0.05	DR
662M68		8.291	0.043	0.52	8.303	0.049	0.56	OE
7EKHMU		8.173	-0.075	-0.92	8.246	-0.008	-0.10	OE
8MJ7DY		8.147	-0.101	-1.22	8.188	-0.066	-0.76	OE
A8XFKA		8.200	-0.048	-0.58	8.213	-0.042	-0.48	OE
AAM2YJ		8.270	0.022	0.27	8.265	0.011	0.12	OE
AV48RZ		8.240	-0.008	-0.10	8.218	-0.036	-0.41	WD
D3WJFR		8.260	0.012	0.15	8.264	0.010	0.11	GD
DGDLTA		8.267	0.019	0.23	8.268	0.013	0.15	XX
DHXQUR		8.253	0.005	0.07	8.263	0.009	0.10	OE
DJY8LX	X	8.725	0.477	5.80	8.751	0.496	5.67	GD
E2W3CU		8.203	-0.045	-0.54	8.197	-0.058	-0.66	OE
E3AJRT	*	8.021	-0.227	-2.76	8.007	-0.247	-2.83	OE
E6X79M		8.271	0.023	0.28	8.360	0.106	1.21	OE
EHF24K		8.185	-0.063	-0.77	8.256	0.002	0.02	IC
FA6RX6		8.240	-0.008	-0.10	8.247	-0.008	-0.09	OE
FHCKXY		8.140	-0.108	-1.31	8.120	-0.134	-1.54	OE
FYG4J4		8.120	-0.128	-1.55	8.150	-0.104	-1.19	OE
G3J6EY		8.257	0.009	0.11	8.343	0.089	1.01	XR
GFAW3A		8.262	0.014	0.17	8.275	0.021	0.23	WD
H9U8GD		8.116	-0.132	-1.60	8.100	-0.154	-1.76	GD
HF4XNR		8.167	-0.081	-0.99	8.167	-0.088	-1.00	OE
JLHCGM		8.263	0.015	0.19	8.260	0.006	0.06	GR
JRWWVN		8.213	-0.035	-0.42	8.246	-0.008	-0.09	OE
L6PCPE		8.247	-0.001	-0.01	8.235	-0.020	-0.23	WD
LNMTVW		8.191	-0.057	-0.70	8.233	-0.022	-0.25	OE
MQN3HK		8.303	0.055	0.67	8.305	0.051	0.58	WC
N22MDZ		8.253	0.005	0.07	8.253	-0.001	-0.01	OE
NE9NXW		8.080	-0.168	-2.04	8.089	-0.165	-1.89	OE
NWQGV9		8.280	0.032	0.39	8.300	0.046	0.52	OE
P4398Q	*	8.503	0.255	3.10	8.507	0.252	2.88	OE
P8QE8F		8.327	0.079	0.96	8.320	0.066	0.75	OE
Q6TNCK		8.221	-0.027	-0.33	8.206	-0.048	-0.55	WD
QFBEPW		8.273	0.025	0.31	8.277	0.022	0.25	OE
R69B6Y		8.197	-0.051	-0.62	8.180	-0.074	-0.85	OE
RPGAUM		8.300	0.052	0.63	8.237	-0.018	-0.20	OE
RQ6UBQ		8.215	-0.033	-0.40	8.274	0.020	0.22	OE
U6JVT2		8.217	-0.031	-0.37	8.208	-0.047	-0.53	XX
UGAKQL		8.200	-0.048	-0.58	8.167	-0.088	-1.00	WD
VDNHX7	*	8.498	0.250	3.04	8.512	0.257	2.93	OE
VNB89D		8.275	0.027	0.33	8.255	0.000	0.00	WD
VTJP92	*	8.377	0.129	1.56	8.470	0.216	2.46	OE
VYQCP9		8.344	0.096	1.16	8.295	0.040	0.46	WD
W9VJFV		8.241	-0.007	-0.09	8.224	-0.030	-0.34	IC
WP2N48		8.223	-0.025	-0.30	8.210	-0.044	-0.51	OE



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 186

Corrosion Resistant Steel, Element #7
NICKEL (Ni)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
WW24TE		8.217	-0.031	-0.37	8.214	-0.040	-0.46	OE
WXGFD7		8.333	0.085	1.04	8.297	0.042	0.48	GD
XDFXLM		8.253	0.005	0.06	8.243	-0.011	-0.13	WD
XUEYK9		8.197	-0.051	-0.62	8.237	-0.018	-0.20	IC
Y2JDQ3		8.250	0.002	0.02	8.333	0.079	0.90	AA
YB92D6		8.329	0.081	0.99	8.258	0.004	0.04	IC
YTBLLLE		8.337	0.089	1.08	8.368	0.114	1.30	OE
YTNDY3		8.306	0.058	0.70	8.304	0.049	0.56	OE
YU4RQB		8.246	-0.002	-0.02	8.245	-0.009	-0.11	WD
Z6LLJJ		8.337	0.089	1.08	8.347	0.092	1.05	OE
Z7FA2E		8.247	-0.001	-0.01	8.242	-0.013	-0.15	OE
ZMYBDH		8.213	-0.035	-0.42	8.197	-0.058	-0.66	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	8.248	Percent	8.254	Percent
Stnd Dev Btwn Labs	0.082	Percent	0.088	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 57 of 59 reporting participants

Key to Method Codes Reported by Participants

AA	Spectrometry - Atomic Absorption (AAS)	DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)	GR	Gravimetry
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

Comments on Assigned Data Flags for Test #186

DJY8LX (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample M64.



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 186

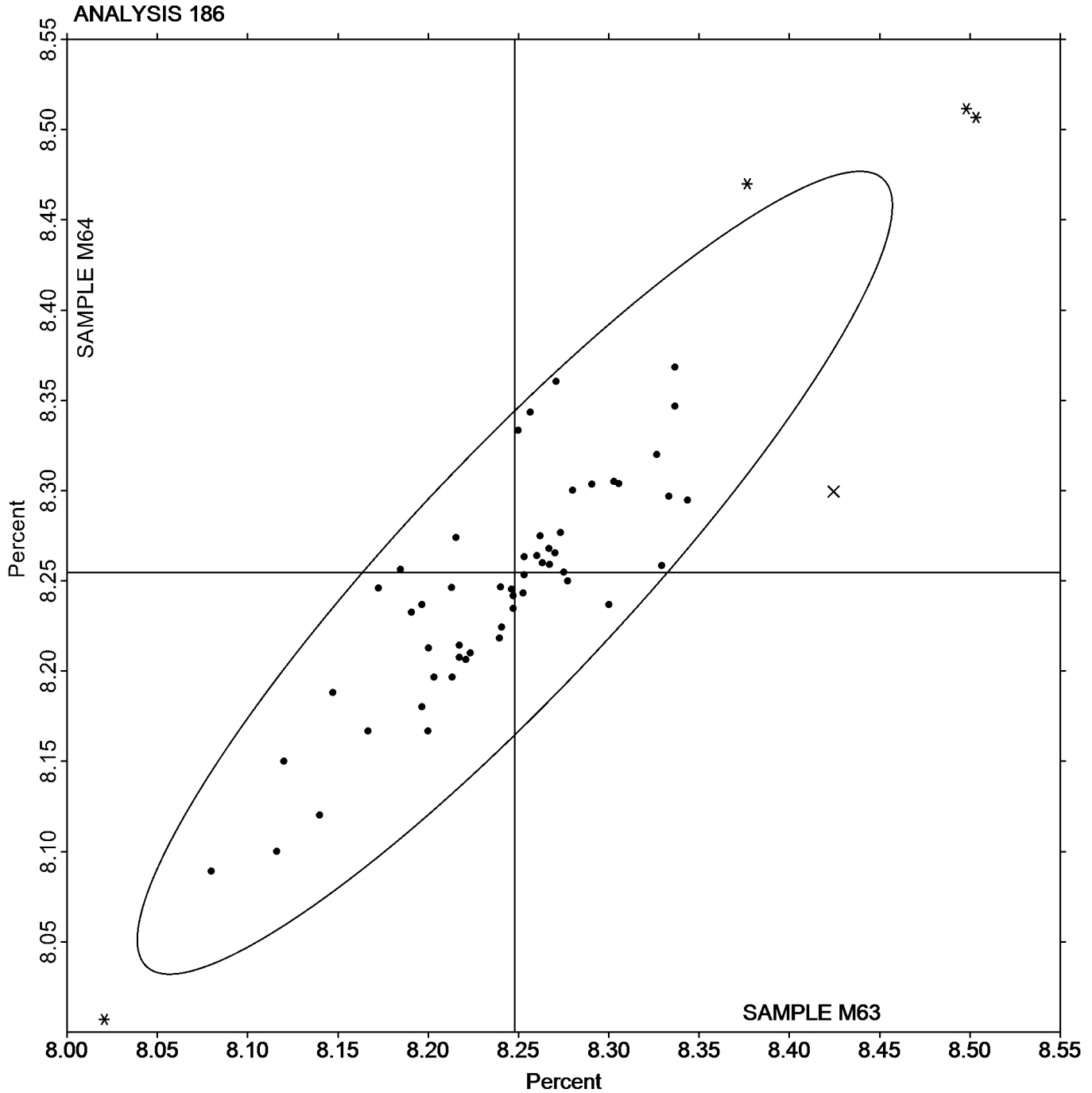
Corrosion Resistant Steel, Element #7
NICKEL (Ni)

SAMPLE M63

8.248 Percent

SAMPLE M64

8.254 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 187

Corrosion Resistant Steel, Element #8
CHROMIUM (Cr)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		18.15	-0.08	-0.85	18.33	-0.03	-0.28	OE
2E7EB7		18.14	-0.09	-0.96	18.24	-0.12	-1.13	OE
4PDTGX		18.25	0.02	0.18	18.39	0.03	0.31	DR
662M68		18.17	-0.06	-0.66	18.36	0.00	-0.04	OE
7EKHMU		18.22	-0.01	-0.11	18.32	-0.04	-0.36	OE
8MJ7DY		18.23	0.00	-0.03	18.42	0.06	0.54	OE
A8XFKA		18.21	-0.03	-0.27	18.35	-0.01	-0.14	OE
AAM2YJ		18.14	-0.09	-0.98	18.29	-0.07	-0.72	OE
AV48RZ		18.08	-0.15	-1.62	18.23	-0.13	-1.24	WD
D3WJFR		18.18	-0.06	-0.59	18.31	-0.05	-0.49	GD
DGDLTA		18.20	-0.04	-0.39	18.28	-0.08	-0.76	XX
DHXQUR		18.13	-0.10	-1.05	18.20	-0.16	-1.55	OE
DJY8LX	X	18.23	0.00	0.00	18.03	-0.33	-3.16	GD
E2W3CU		18.38	0.15	1.55	18.48	0.12	1.18	XX
E3AJRT		18.27	0.04	0.42	18.39	0.03	0.25	OE
E6X79M	X	18.31	0.08	0.81	18.18	-0.18	-1.74	OE
EHF24K		18.05	-0.18	-1.89	18.10	-0.26	-2.48	IC
FA6RX6		18.29	0.06	0.60	18.41	0.05	0.47	OE
FHCKXY		18.17	-0.06	-0.66	18.29	-0.07	-0.72	OE
FYG4J4		18.28	0.05	0.49	18.40	0.04	0.38	OE
G3J6EY		18.08	-0.15	-1.61	18.26	-0.10	-0.97	XR
GFAW3A		18.29	0.05	0.56	18.40	0.04	0.37	WD
H9U8GD		18.31	0.07	0.77	18.45	0.09	0.87	GD
HF4XNR	*	18.41	0.18	1.90	18.62	0.26	2.50	OE
JLHCGM		18.17	-0.06	-0.63	18.27	-0.09	-0.88	TI
JRWVWN		18.27	0.03	0.34	18.41	0.05	0.44	OE
L6PCPE		18.17	-0.07	-0.69	18.30	-0.06	-0.57	WD
LNMTVW	X	18.04	-0.19	-2.00	17.96	-0.40	-3.86	OE
MQN3HK		18.19	-0.04	-0.45	18.40	0.04	0.41	WC
N22MDZ		18.37	0.14	1.48	18.46	0.10	0.92	OE
NE9NXW		18.42	0.18	1.93	18.54	0.18	1.69	OE
NWQGV9		18.48	0.25	2.60	18.58	0.22	2.14	OE
P4398Q		18.23	0.00	0.00	18.37	0.01	0.12	OE
P8QE8F		18.27	0.04	0.39	18.36	0.00	0.02	OE
Q6TNCK		18.14	-0.09	-0.98	18.30	-0.06	-0.59	WD
QFBEPW		18.17	-0.06	-0.66	18.30	-0.06	-0.62	OE
R69B6Y		18.27	0.04	0.42	18.40	0.04	0.34	OE
RPGAUM		18.21	-0.02	-0.21	18.35	-0.01	-0.11	OE
RQ6UBQ		18.14	-0.10	-1.03	18.28	-0.08	-0.78	OE
U6JVT2		18.22	-0.02	-0.18	18.37	0.01	0.07	XX
UGAKQL		18.24	0.01	0.12	18.38	0.02	0.19	WD
VDNHX7		18.19	-0.04	-0.44	18.26	-0.10	-0.95	OE
VNB89D		18.23	-0.01	-0.07	18.28	-0.08	-0.75	WD
VTJP92		18.36	0.13	1.34	18.57	0.21	1.98	OE
VYCQP9		18.28	0.04	0.47	18.38	0.02	0.22	WD
W9VJFV		18.29	0.06	0.64	18.41	0.05	0.51	IC
WP2N48		18.23	0.00	-0.03	18.35	-0.01	-0.07	OE



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 187

Corrosion Resistant Steel, Element #8
CHROMIUM (Cr)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
WW24TE		18.17	-0.07	-0.70	18.26	-0.10	-1.00	OE
WXGFD7	X	18.07	-0.17	-1.75	18.03	-0.33	-3.16	GD
XDFXLM		18.04	-0.19	-2.01	18.19	-0.18	-1.69	WD
XUEYK9		18.20	-0.03	-0.35	18.27	-0.09	-0.91	TI
Y2JDQ3	X	18.20	-0.03	-0.35	18.53	0.17	1.66	AA
YB92D6	X	17.97	-0.26	-2.78	17.96	-0.40	-3.84	IC
YTBLL		18.41	0.18	1.89	18.49	0.13	1.21	OE
YTNDY3		18.19	-0.04	-0.42	18.30	-0.06	-0.62	OE
YU4RQB		18.35	0.11	1.20	18.53	0.17	1.64	WD
Z6LLJJ		18.33	0.09	0.99	18.40	0.04	0.41	OE
Z7FA2E		18.22	-0.01	-0.13	18.35	-0.01	-0.13	OE
ZMYBDH		18.27	0.03	0.35	18.50	0.14	1.37	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	18.23	Percent	18.36	Percent
Stnd Dev Btwn Labs	0.10	Percent	0.10	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 53 of 59 reporting participants

Key to Method Codes Reported by Participants

AA	Spectrometry - Atomic Absorption (AAS)	DR	Spectrometry - Direct Reading OE (DROES)
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

Comments on Assigned Data Flags for Test #187

- DJY8LX (X) - Data for sample M64 are low. Inconsistent within the determinations of sample M64.
- E6X79M (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- LNMTVW (X) - Data for sample M64 are low. Inconsistent within the determinations of sample M63.
- WXGFD7 (X) - Data for sample M64 are low.
- Y2JDQ3 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample M63.
- YB92D6 (X) - Data for both samples are low. Possible Systematic Error.



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 187

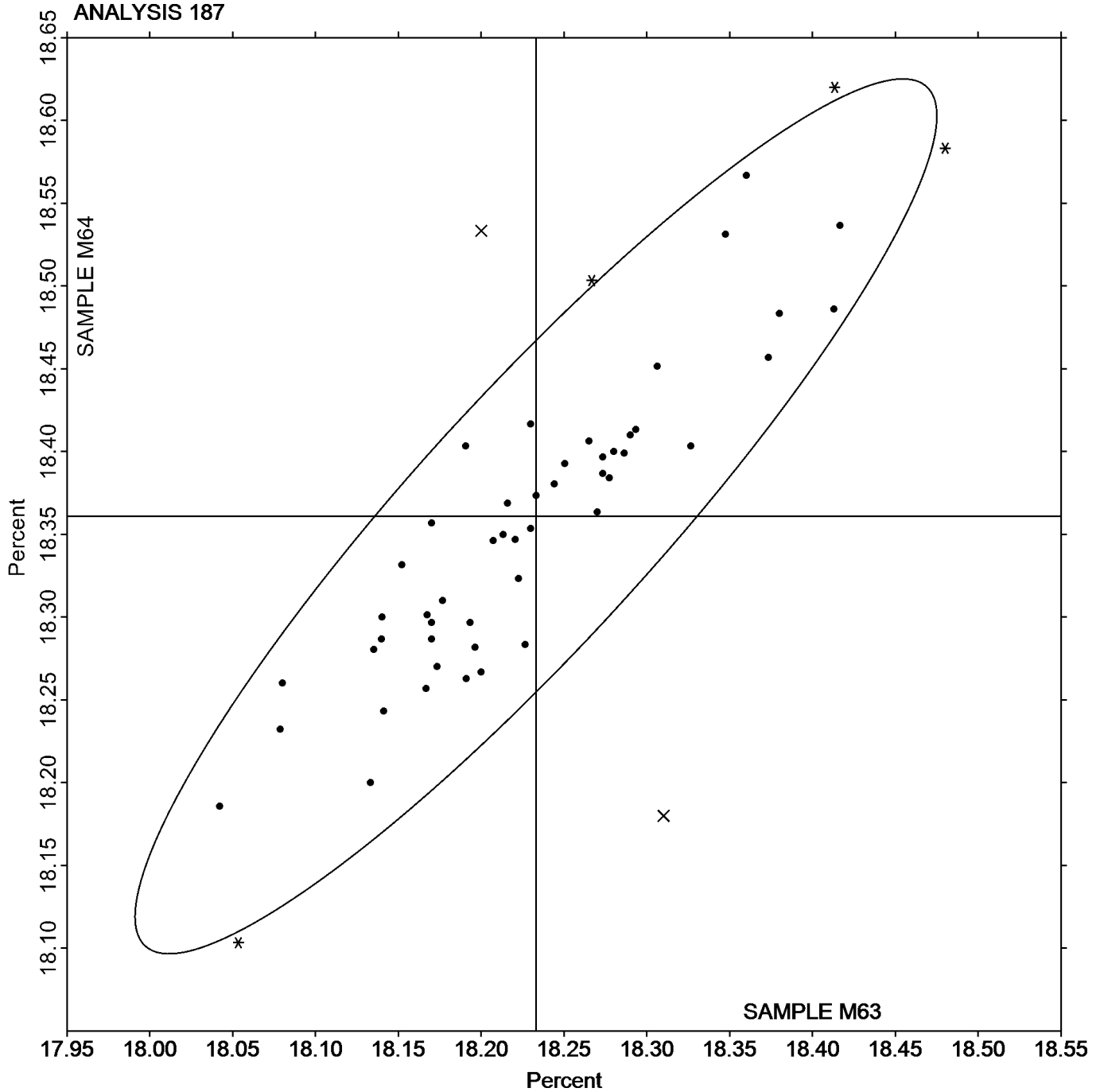
Corrosion Resistant Steel, Element #8
CHROMIUM (Cr)

SAMPLE M63

18.23 Percent

SAMPLE M64

18.36 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 188

Corrosion Resistant Steel, Element #9
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU		0.3769	0.0118	1.10	0.3872	0.0071	0.62	OE
2E7EB7		0.3569	-0.0082	-0.77	0.3788	-0.0013	-0.11	OE
4PDTGX		0.3753	0.0102	0.95	0.3920	0.0120	1.05	DR
662M68		0.3503	-0.0148	-1.38	0.3633	-0.0167	-1.46	OE
7EKHMU		0.3538	-0.0114	-1.06	0.3668	-0.0132	-1.15	OE
8MJ7DY	X	0.3461	-0.0190	-1.77	0.3737	-0.0063	-0.55	OE
A8XFKA		0.3779	0.0127	1.19	0.3951	0.0151	1.32	OE
AAM2YJ	*	0.3957	0.0305	2.84	0.4133	0.0333	2.91	OE
AV48RZ		0.3643	-0.0008	-0.07	0.3797	-0.0004	-0.03	WD
D3WJFR		0.3587	-0.0065	-0.60	0.3743	-0.0057	-0.50	GD
DGDLTA		0.3660	0.0009	0.08	0.3814	0.0014	0.12	XX
DHXQUR		0.3600	-0.0051	-0.48	0.3700	-0.0100	-0.88	OE
DJY8LX	*	0.3963	0.0312	2.90	0.4093	0.0293	2.56	GD
E2W3CU		0.3547	-0.0105	-0.97	0.3697	-0.0104	-0.91	OE
E3AJRT		0.3797	0.0145	1.35	0.3980	0.0180	1.57	OE
E6X79M		0.3660	0.0009	0.08	0.3847	0.0046	0.41	OE
EHF24K		0.3590	-0.0061	-0.57	0.3807	0.0006	0.06	IC
FA6RX6		0.3727	0.0075	0.70	0.3880	0.0080	0.70	OE
FHCKXY		0.3720	0.0069	0.64	0.3820	0.0020	0.17	OE
FYG4J4		0.3600	-0.0051	-0.48	0.3800	0.0000	0.00	OE
G3J6EY		0.3690	0.0039	0.36	0.3807	0.0006	0.06	XR
GFAW3A		0.3653	0.0002	0.02	0.3807	0.0006	0.06	WD
H9U8GD	X	0.3960	0.0309	2.87	0.4190	0.0390	3.41	GD
JLHCGM		0.3653	0.0002	0.02	0.3823	0.0023	0.20	IC
JRWVVN		0.3637	-0.0015	-0.14	0.3760	-0.0040	-0.35	OE
L6PCPE		0.3663	0.0012	0.11	0.3807	0.0006	0.06	WD
LNMTVW		0.3540	-0.0111	-1.04	0.3703	-0.0097	-0.85	OE
N22MDZ		0.3653	0.0002	0.02	0.3810	0.0010	0.08	OE
NE9NXW	X	0.4043	0.0392	3.65	0.4167	0.0366	3.21	OE
NWQGV9		0.3570	-0.0081	-0.76	0.3677	-0.0124	-1.08	OE
P4398Q		0.3600	-0.0051	-0.48	0.3760	-0.0040	-0.35	OE
P8QE8F	X	0.4000	0.0349	3.24	0.3533	-0.0267	-2.34	OE
Q6TNCK		0.3673	0.0022	0.20	0.3820	0.0020	0.17	WD
QFBEPW	*	0.3343	-0.0308	-2.87	0.3460	-0.0340	-2.98	OE
R69B6Y		0.3543	-0.0108	-1.01	0.3677	-0.0124	-1.08	OE
RPGAUM		0.3573	-0.0078	-0.73	0.3697	-0.0104	-0.91	OE
RQ6UBQ		0.3710	0.0058	0.54	0.3860	0.0059	0.52	OE
U6JVT2		0.3653	0.0002	0.02	0.3813	0.0013	0.11	XX
UGAKQL		0.3565	-0.0086	-0.80	0.3698	-0.0103	-0.90	WD
VDNHX7		0.3583	-0.0068	-0.64	0.3749	-0.0051	-0.45	OE
VNB89D		0.3620	-0.0031	-0.29	0.3770	-0.0030	-0.27	WD
VTJP92	X	0.2300	-0.1351	-12.58	0.2367	-0.1434	-12.54	OE
VYCQP9		0.3638	-0.0013	-0.12	0.3790	-0.0010	-0.09	WD
W9VJFV		0.3597	-0.0055	-0.51	0.3727	-0.0074	-0.64	IC
WP2N48		0.3603	-0.0048	-0.45	0.3730	-0.0070	-0.62	OE
WW24TE		0.3687	0.0035	0.33	0.3840	0.0040	0.35	OE
WXGFD7		0.3830	0.0179	1.66	0.3947	0.0146	1.28	GD



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 188

Corrosion Resistant Steel, Element #9
MOLYBDENUM (Mo)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XDFXLM		0.3633	-0.0018	-0.17	0.3782	-0.0019	-0.16	WD
XUEYK9		0.3597	-0.0055	-0.51	0.3697	-0.0104	-0.91	IC
Y2JDQ3	X	0.3933	0.0282	2.62	0.4233	0.0433	3.79	AA
YB92D6		0.3737	0.0085	0.79	0.3913	0.0113	0.99	IC
YTBLLLE		0.3613	-0.0038	-0.35	0.3800	0.0000	0.00	OE
YTNDY3		0.3643	-0.0008	-0.07	0.3803	0.0003	0.03	OE
YU4RQB		0.3692	0.0041	0.38	0.3850	0.0050	0.44	WD
Z6LLJJ		0.3847	0.0195	1.82	0.4013	0.0213	1.86	OE
Z7FA2E		0.3633	-0.0018	-0.17	0.3777	-0.0024	-0.21	OE
ZMYBDH		0.3583	-0.0068	-0.63	0.3707	-0.0094	-0.82	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.3651	Percent	0.3800	Percent
Stnd Dev Btwn Labs	0.0107	Percent	0.0114	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 51 of 57 reporting participants

Key to Method Codes Reported by Participants

AA	Spectrometry - Atomic Absorption (AAS)	DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)	IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)	WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified	XX	Please Indicate Method Used for Current Element

Comments on Assigned Data Flags for Test #188

- 8MJ7DY (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- H9U8GD (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample M64.
- NE9NXW (X) - Data for both samples are high. Possible Systematic Error.
- P8QE8F (X) - Data for sample M63 are high. Inconsistent within the determinations of sample M64.
- VTJP92 (X) - Data for both samples are low. Possible Systematic Error. Inconsistent within the determinations of sample M64.
- Y2JDQ3 (X) - Data for sample M64 are high. Inconsistent within the determinations of both samples.



Fasteners and Metals Interlaboratory Testing Program

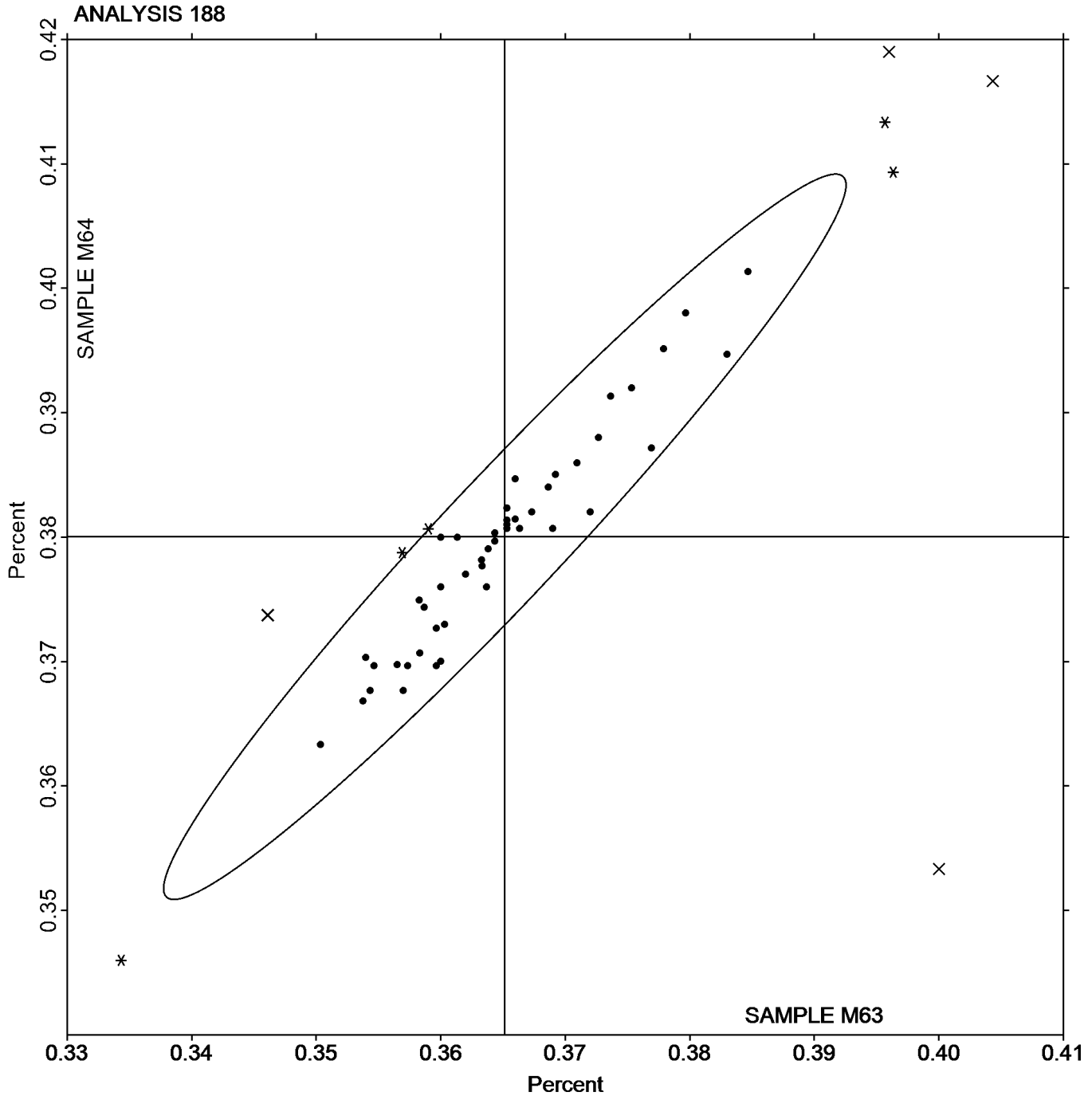
Cycle 128
4th Qtr 2019

Analysis 188

Corrosion Resistant Steel, Element #9
MOLYBDENUM (Mo)

SAMPLE M63
0.3651 Percent

SAMPLE M64
0.3800 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 189

Corrosion Resistant Steel, Element #10
COPPER (Cu)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
29PYEU	X	0.6429	0.0681	4.61	0.5692	0.0485	3.62	OE
2E7EB7		0.5707	-0.0041	-0.28	0.5235	0.0027	0.20	OE
4PDTGX		0.5583	-0.0165	-1.12	0.5107	-0.0101	-0.75	DR
662M68		0.5957	0.0208	1.41	0.5307	0.0099	0.74	OE
7EKHMU		0.5523	-0.0225	-1.53	0.5062	-0.0146	-1.09	OE
8MJ7DY		0.5569	-0.0179	-1.21	0.5134	-0.0074	-0.55	OE
A8XFKA		0.5964	0.0216	1.46	0.5414	0.0207	1.54	OE
AAM2YJ		0.5717	-0.0032	-0.21	0.5150	-0.0058	-0.43	OE
AV48RZ		0.5757	0.0008	0.06	0.5197	-0.0011	-0.08	WD
D3WJFR		0.5713	-0.0035	-0.24	0.5170	-0.0038	-0.28	GD
DGDLTA		0.5779	0.0031	0.21	0.5233	0.0026	0.19	XX
DHXQUR		0.5933	0.0185	1.25	0.5333	0.0126	0.94	OE
DJY8LX	*	0.6163	0.0415	2.81	0.5630	0.0422	3.15	GD
E2W3CU	X	0.1720	-0.4028	-27.27	0.1560	-0.3648	-27.23	OE
E3AJRT		0.5477	-0.0272	-1.84	0.4960	-0.0248	-1.85	OE
E6X79M		0.5773	0.0025	0.17	0.5327	0.0119	0.89	OE
EHF24K		0.5727	-0.0022	-0.15	0.5130	-0.0078	-0.58	IC
FA6RX6		0.5750	0.0002	0.01	0.5203	-0.0004	-0.03	OE
FHCKXY		0.5700	-0.0048	-0.33	0.5200	-0.0008	-0.06	OE
FYG4J4		0.5700	-0.0048	-0.33	0.5200	-0.0008	-0.06	OE
G3J6EY		0.5847	0.0098	0.67	0.5257	0.0049	0.37	XR
GFAW3A		0.5770	0.0022	0.15	0.5200	-0.0008	-0.06	WD
H9U8GD		0.5857	0.0108	0.73	0.5340	0.0132	0.99	GD
JLHCGM		0.5753	0.0005	0.03	0.5250	0.0042	0.32	IC
JRWVVN		0.5763	0.0015	0.10	0.5233	0.0026	0.19	OE
L6PCPE		0.5737	-0.0012	-0.08	0.5187	-0.0021	-0.16	WD
LNMTVW		0.5803	0.0055	0.37	0.5263	0.0056	0.42	OE
N22MDZ		0.5600	-0.0148	-1.00	0.5103	-0.0104	-0.78	OE
NE9NXW		0.6067	0.0318	2.15	0.5510	0.0302	2.26	OE
NWQGV9		0.5620	-0.0128	-0.87	0.5093	-0.0114	-0.85	OE
P4398Q		0.5937	0.0188	1.27	0.5353	0.0146	1.09	OE
P8QE8F		0.5467	-0.0282	-1.91	0.4967	-0.0241	-1.80	OE
Q6TNCK		0.5770	0.0022	0.15	0.5210	0.0002	0.02	WD
QFBEPW		0.6030	0.0282	1.91	0.5397	0.0189	1.41	OE
R69B6Y		0.5713	-0.0035	-0.24	0.5130	-0.0078	-0.58	OE
RPGAUM		0.5517	-0.0232	-1.57	0.4953	-0.0254	-1.90	OE
RQ6UBQ		0.5719	-0.0029	-0.20	0.5239	0.0032	0.24	OE
U6JVT2		0.5867	0.0118	0.80	0.5287	0.0079	0.59	XX
UGAKQL		0.5747	-0.0001	-0.01	0.5197	-0.0010	-0.08	WD
VDNHX7		0.5709	-0.0039	-0.27	0.5153	-0.0055	-0.41	OE
VNB89D		0.5787	0.0038	0.26	0.5170	-0.0038	-0.28	WD
VTJP92		0.5993	0.0245	1.66	0.5510	0.0302	2.26	OE
VYCQP9		0.5674	-0.0074	-0.50	0.5139	-0.0069	-0.51	WD
W9VJFV		0.5777	0.0028	0.19	0.5183	-0.0024	-0.18	IC
WP2N48		0.5787	0.0038	0.26	0.5203	-0.0004	-0.03	OE
WW24TE		0.5610	-0.0138	-0.94	0.5083	-0.0124	-0.93	OE
WXGFD7		0.5617	-0.0132	-0.89	0.5183	-0.0024	-0.18	GD



Fasteners and Metals Interlaboratory Testing Program

Cycle 128
4th Qtr 2019

Analysis 189

Corrosion Resistant Steel, Element #10
COPPER (Cu)

WebCode	Data Flag	Sample M63			Sample M64			Method
		Lab Mean	Diff. from Grand Mean	CPV	Lab Mean	Diff. from Grand Mean	CPV	
XDFXLM		0.5712	-0.0036	-0.25	0.5164	-0.0043	-0.32	WD
XUEYK9		0.5617	-0.0132	-0.89	0.4957	-0.0251	-1.87	IC
Y2JDQ3		0.5833	0.0085	0.58	0.5300	0.0092	0.69	AA
YTBLLLE		0.5733	-0.0015	-0.10	0.5180	-0.0028	-0.21	OE
YTNDY3		0.5833	0.0085	0.58	0.5223	0.0016	0.12	OE
YU4RQB		0.5795	0.0047	0.32	0.5247	0.0039	0.29	WD
Z6LLJJ		0.5450	-0.0298	-2.02	0.4983	-0.0224	-1.67	OE
Z7FA2E		0.5710	-0.0038	-0.26	0.5170	-0.0038	-0.28	OE
ZMYBDH		0.5700	-0.0048	-0.33	0.5200	-0.0008	-0.06	OE

Summary Statistics

	Sample M63		Sample M64	
Grand Means	0.5748	Percent	0.5208	Percent
Stnd Dev Btrwn Labs	0.0148	Percent	0.0134	Percent

Samples M63, M64 : AISI 304, AISI 304

Statistics based on 54 of 56 reporting participants

Key to Method Codes Reported by Participants

AA	Spectrometry - Atomic Absorption (AAS)	DR	Spectrometry - Direct Reading OE (DROES)
GD	Spectrometry - Glow Discharge (GDS)	IC	Spectrometry - Inductively Coupled Plasma (ICP)
OE	Spectrometry - Optical Emission (OES)	WD	X-Ray Fluorescence - Wavelength Dispersive (WDX)
XR	X-Ray Fluorescence - ED or WD not specified	XX	Please Indicate Method Used for Current Element

Comments on Assigned Data Flags for Test #189

29PYEU (X) - Data for both samples are high. Possible Systematic Error.

E2W3CU (X) - Data appear to be for Test 185: Cobalt (Co) rather than Test 189: Copper (Cu)



Fasteners and Metals Interlaboratory Testing Program

Cycle 128

Analysis 189

4th Qtr 2019

Corrosion Resistant Steel, Element #10

COPPER (Cu)

SAMPLE M63
0.5748 Percent

SAMPLE M64
0.5208 Percent

