

Fasteners & Metals Interlaboratory Testing Program

Summary Report Cycle 131, 3rd Qtr 2020

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| <u>Analysis</u> | <u>Test Group</u> |
|-----------------|-------------------|
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| Dimensional Tests | |
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| 1001 | Dimensional: Outside Diameter of Plain Plug Gage |
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| Tensile Tests | |
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| 1101 | Tensile Strength: Lab-Machined Flat Aluminum |
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| 1102 | Yield Strength: Lab-Machined Flat Aluminum |
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| 1103 | Elongation: Lab-Machined Flat Aluminum |
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| 1111 | Tensile Strength: Pre-Machined Round Steel |
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| 1112 | Yield Strength: Pre-Machined Round Steel |
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| 1113 | Elongation: Pre-Machined Round Steel |
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| 1114 | Reduction of Area: Pre-Machined Round Steel |
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| 1121 | Tensile Strength: Lab-Machined Round Steel |
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| 1122 | Yield Strength: Lab-Machined Round Steel |
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| 1123 | Elongation: Lab-Machined Round Steel |
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| 1124 | Reduction of Area: Lab-Machined Round Steel |
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| Hardness / Metallography Tests | |
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| 1301 | Rockwell Hardness: C & B Scales |
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| 1302 | Rockwell Hardness: B Scale |
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| 1321 | Microhardness: Knoop Indenters (500 gf) |
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| 1322 | Microhardness: Knoop Indenters (200 gf) |
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| 1323 | Microhardness: Vickers Indenters (500 gf) |
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| 1341 | Brinell Hardness |
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| Chemical Analyses | |
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| 1521 - 1527 | Chemical Analysis: Titanium-based Alloy |
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| 1600 - 1614 | Chemical Analysis: Carbon & Low Alloy Steel |
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ABOUT THE FASTENERS & METALS PROGRAM

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

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

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

ABOUT CTS

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

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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. |

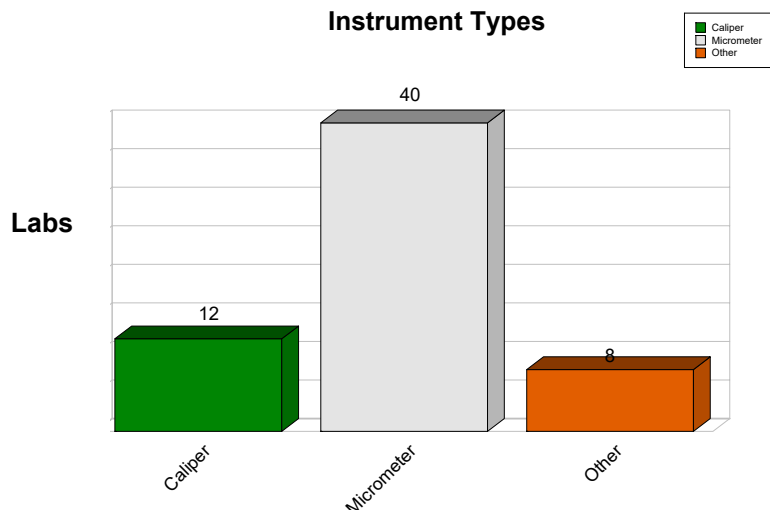
Graph - For each laboratory, the Lab Mean for the second sample (y-axis) is plotted against the Lab Mean for the first sample (x-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the Grand Means for each sample. When 20 or more laboratories are included in the 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.



Analysis 1001

Dimensional: Outside Diameter of Plain Plug Gage
ISO GUM

During Cycle 131, CTS conducted the Analysis #101 - Round Dimensional. For this test all participants received two samples I69 and I70 with nominal diameters; 0.4996 in. and 0.5000 in. Each sample is an English Class X gage pin with 0.00002 in roundness limit made from 52100 bearing steel, hardened to 60-62 Rockwell C. Laboratories were asked to determine the outside diameter of the pins. 60 laboratories that subscribed for this test reported testing results. The graph below shows a breakdown of the types of instruments used.



Analysis of the Results

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

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

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

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

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

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



Fasteners and Metals Interlaboratory Testing Program

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Analysis 1001

Dimensional: Outside Diameter of Plain Plug Gage ISO GUM

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

Xref1 = 0.4996 in.

Xref2 = 0.5000 in.

Sample I69

Sample I70

| WebCode | Data Flag (if assigned) | Reference Uncertainty (Uref) | Expanded Uncertainty (Ulab) | Lab Mean (Xlab) | Performance Statistic (En1) | Lab Mean (Xlab) | Performance Statistic (En2) | Instrument |
|---------|----------------------------|------------------------------------|-----------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|------------|
| 3BNWRB | | 0.00004 | 0.04331 | 0.49952 | 0.00 | 0.49987 | 0.00 | Micrometer |
| 3JHXDV | | 0.00004 | Not Reported | 0.49957 | | 0.49997 | | Micrometer |
| 4BMFCR | | 0.00004 | 0.00015 | 0.49960 | 0.00 | 0.49996 | -0.26 | Micrometer |
| 4H6TBQ | | 0.00004 | 0.00120 | 0.49958 | -0.02 | 0.50002 | 0.02 | Micrometer |
| 6APBCP | X | 0.00004 | 0.00050 | 0.50056 | 1.91 | 0.50102 | 2.03 | Other |
| 7V67NT | | 0.00004 | 0.00100 | 0.49920 | -0.40 | 0.49970 | -0.30 | Caliper |
| 83GURT | | 0.00004 | 0.00008 | 0.49959 | -0.10 | 0.49999 | -0.09 | Micrometer |
| 8WRAND | | 0.00004 | 0.00090 | 0.49948 | -0.13 | 0.49980 | -0.22 | Micrometer |
| 9T7MVQ | X | 0.00004 | 0.00003 | 0.49950 | -2.00 | 0.49990 | -2.00 | Micrometer |
| 9WPWNN | | 0.00004 | 0.00100 | 0.50000 | 0.40 | 0.50050 | 0.50 | Caliper |
| 9X49K8 | | 0.00004 | 0.00040 | 0.49954 | -0.15 | 0.49982 | -0.45 | Micrometer |
| AB4GLM | | 0.00004 | Not Reported | 0.49946 | | 0.49982 | | Micrometer |
| AKMZW7 | | 0.00004 | 0.00059 | 0.49951 | -0.15 | 0.49997 | -0.05 | Micrometer |
| AP7TGL | | 0.00004 | 0.00050 | 0.49960 | 0.00 | 0.50000 | 0.00 | Micrometer |
| AT2PVE | X | 0.00004 | 0.00013 | 0.49945 | -1.10 | 0.49991 | -0.66 | Micrometer |
| AUF8YK | | 0.00004 | 0.00260 | 0.49960 | 0.00 | 0.49980 | -0.08 | Caliper |
| B2BHLZ | | 0.00004 | Not Reported | 0.49956 | | 0.50001 | | Micrometer |
| BWWZ4J | | 0.00004 | 0.00039 | 0.49959 | -0.02 | 0.50002 | 0.04 | Micrometer |
| CU8QW4 | X | 0.00004 | 0.00005 | 0.49950 | -1.56 | 0.50000 | 0.00 | Caliper |
| D2NP33 | | 0.00004 | 0.00150 | 0.49900 | -0.40 | 0.49950 | -0.33 | Caliper |
| DKGRGH | X | 0.00004 | 0.00020 | 0.49956 | -0.20 | 0.50024 | 1.18 | Caliper |
| DQN9XJ | | 0.00004 | Not Reported | 0.49950 | | 0.50000 | | Other |
| EL8BXA | | 0.00004 | 0.00015 | 0.49960 | 0.00 | 0.50000 | 0.00 | Micrometer |
| F6GPUU | | 0.00004 | 0.00200 | 0.49949 | -0.06 | 0.49998 | -0.01 | Micrometer |
| F862TZ | | 0.00004 | Not Reported | 0.49950 | | 0.50000 | | Micrometer |
| G6BQFC | | 0.00004 | 0.00016 | 0.49958 | -0.12 | 0.49997 | -0.19 | Micrometer |
| GHZUEW | | 0.00004 | 0.00030 | 0.49955 | -0.17 | 0.49990 | -0.33 | Micrometer |
| GY62UX | | 0.00004 | 0.00094 | 0.49957 | -0.03 | 0.49991 | -0.10 | Micrometer |
| J4BEN3 | X | 0.00004 | 0.00008 | 0.49940 | -2.24 | 0.49980 | -2.24 | Micrometer |
| KAVPJH | | 0.00004 | 0.00044 | 0.49950 | -0.23 | 0.49990 | -0.23 | Micrometer |
| KJMALA | | 0.00004 | Not Reported | 0.49960 | | 0.50000 | | Micrometer |
| L6GJEV | | 0.00004 | 0.00030 | 0.49960 | 0.00 | 0.50000 | 0.00 | Micrometer |
| LL4YHR | | 0.00004 | Not Reported | 0.49954 | | 0.49998 | | Other |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1001**

**Cycle 131
3rd Qtr 2020**

**Dimensional: Outside Diameter of Plain Plug Gage
ISO GUM**

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

Xref1 = 0.4996 in.

Xref2 = 0.5000 in.

Sample I69

Sample I70

| <u>WebCode</u> | <u>Data Flag</u> (if assigned) | <u>Reference</u> <u>Uncertainty</u> (Uref) | <u>Expanded</u> <u>Uncertainty</u> (Ulab) | <u>Lab Mean</u> (Xlab) | <u>Performance</u> <u>Statistic (En1)</u> | <u>Lab Mean</u> (Xlab) | <u>Performance</u> <u>Statistic (En2)</u> | <u>Instrument</u> |
|----------------|-----------------------------------|--|---|---------------------------|--|---------------------------|--|-------------------|
| MHYJRF | | 0.00004 | 0.00016 | 0.49965 | 0.33 | 0.50011 | 0.68 | Micrometer |
| NTBEYQ | | 0.00004 | 0.00007 | 0.49958 | -0.29 | 0.50000 | 0.00 | Micrometer |
| NU9MAV | X | 0.00004 | 0.00016 | 0.49942 | -1.12 | 0.49986 | -0.87 | Micrometer |
| PAJNHQ | | 0.00004 | 0.00013 | 0.49960 | 0.00 | 0.50000 | 0.00 | Micrometer |
| PBUNLD | | 0.00004 | 0.00020 | 0.49961 | 0.03 | 0.50000 | 0.00 | Micrometer |
| PDVY9Z | | 0.00004 | 0.00040 | 0.49928 | -0.80 | 0.49985 | -0.37 | Micrometer |
| PVZ7N3 | X | 0.00004 | 0.00009 | 0.49940 | -2.09 | 0.49986 | -1.46 | Micrometer |
| QMY9FP | | 0.00004 | 0.00004 | 0.49957 | -0.58 | 0.49996 | -0.70 | Micrometer |
| R2Z4AB | X | 0.00004 | 0.00012 | 0.49978 | 1.44 | 0.50017 | 1.39 | Other |
| RACELB | | 0.00004 | 0.00201 | 0.49960 | 0.00 | 0.49990 | -0.05 | Micrometer |
| RK9GP6 | | 0.00004 | 0.00008 | 0.49959 | -0.10 | 0.50002 | 0.18 | Micrometer |
| TANEYW | | 0.00004 | 4.47020 | 0.49936 | 0.00 | 0.49978 | 0.00 | Micrometer |
| TQUWT3 | | 0.00004 | 0.00024 | 0.49954 | -0.26 | 0.49994 | -0.25 | Micrometer |
| U9N2PA | | 0.00004 | 0.00042 | 0.49986 | 0.62 | 0.49980 | -0.47 | Caliper |
| UJMRBG | | 0.00004 | 0.00040 | 0.49954 | -0.15 | 0.50000 | 0.00 | Micrometer |
| UXTJK3 | | 0.00004 | 0.00118 | 0.49945 | -0.13 | 0.50000 | 0.00 | Caliper |
| V4BFHN | | 0.00004 | 2.00000 | 0.49955 | 0.00 | 0.49995 | 0.00 | Other |
| VE9GT8 | X | 0.00004 | 0.00023 | 0.49926 | -1.46 | 0.49962 | -1.63 | Other |
| VH9RN8 | X | 0.00004 | 0.00022 | 0.49932 | -1.25 | 0.49958 | -1.88 | Other |
| VU3W4Y | | 0.00004 | 0.00118 | 0.49961 | 0.01 | 0.50000 | 0.00 | Caliper |
| W3UJQN | | 0.00004 | 0.00047 | 0.49962 | 0.05 | 0.50000 | 0.00 | Micrometer |
| WTL4JG | | 0.00004 | <u>Not Reported</u> | 0.49950 | | 0.50000 | | Other |
| X8L4D6 | | 0.00004 | 0.00019 | 0.49946 | -0.71 | 0.50000 | 0.00 | Micrometer |
| YAK3HU | | 0.00004 | 0.00200 | 0.49820 | -0.70 | 0.49880 | -0.60 | Caliper |
| YHF7LQ | | 0.00004 | 0.00015 | 0.49954 | -0.38 | 0.49994 | -0.38 | Micrometer |
| ZGY9UR | | 0.00004 | 0.00210 | 0.49900 | -0.29 | 0.50000 | 0.00 | Caliper |
| ZU9MBR | X | 0.00004 | 0.00090 | 0.49800 | -1.78 | 0.49830 | -1.89 | Caliper |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1001**

**Cycle 131
3rd Qtr 2020**

**Dimensional: Outside Diameter of Plain Plug Gage
ISO GUM**

Summary Statistics

| | <u>Sample I69</u> | <u>Sample I70</u> |
|--------------------------|--------------------------|--------------------------|
| Grand Means | 0.4995 inch | 0.5000 inch |
| Std Dev Btwn Labs | 0.0001 inch | 0.0001 inch |

Samples I69, I70 : 52100 Steel, 52100 Steel

Statistics based on 46 of 60 reporting participants

Comments on Assigned Data Flags for Test #1001

- 6APBCP (X) - En value for both samples was high.
- 9T7MVQ (X) - En value for both samples was low.
- AT2PVE (X) - En value for sample I69 was low.
- CU8QW4 (X) - En value for sample I69 was low.
- DKGRGH (X) - En value for sample I70 was high.
- J4BEN3 (X) - En value for both samples was low.
- LL4YHR (O) - En value for sample I69 was low.
- NU9MAV (X) - En value for sample I69 was low.
- PVZ7N3 (X) - En value for both samples was low.
- R2Z4AB (X) - En value for both samples was high.
- VE9GT8 (X) - En value for both samples was low.
- VH9RN8 (X) - En value for both samples was low.
- WTL4JG (O) - En value for sample I69 was low.
- ZU9MBR (X) - En value for both samples was low.

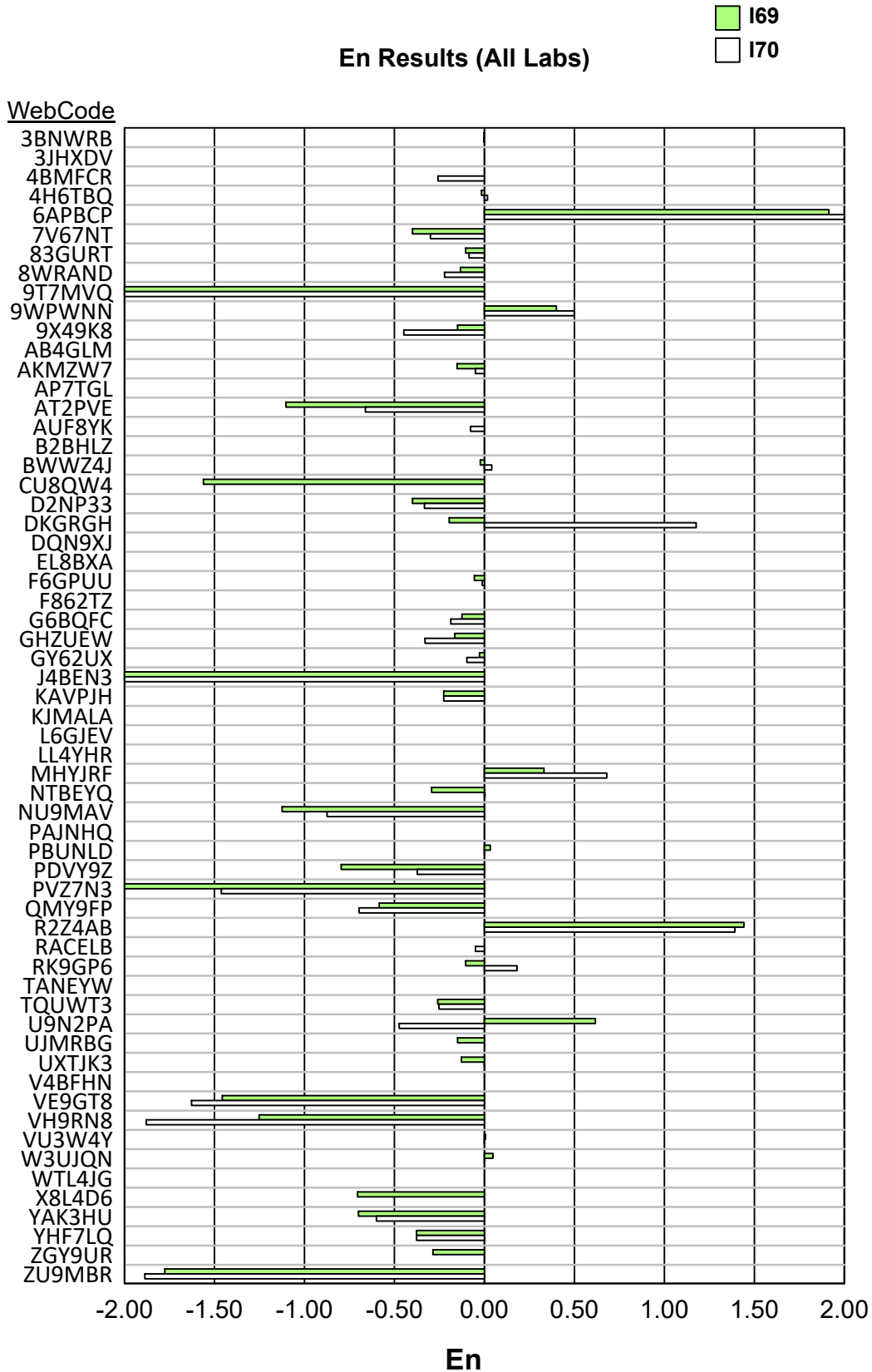


Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1001

Dimensional: Outside Diameter of Plain Plug Gage
ISO GUM





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1101

Tensile Strength: Lab-Machined Flat Aluminum
ASTM B557

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | | 49.60 | 0.08 | 0.15 | 48.00 | -0.04 | -0.08 |
| 2KJ9VT | * | 48.05 | -1.47 | -2.75 | 47.02 | -1.02 | -2.12 |
| 47M9QU | | 49.70 | 0.18 | 0.33 | 48.30 | 0.26 | 0.54 |
| 4CCTUA | | 49.70 | 0.18 | 0.33 | 48.20 | 0.16 | 0.34 |
| 642Q7N | | 50.22 | 0.70 | 1.30 | 49.06 | 1.02 | 2.13 |
| 66RPM8 | | 49.17 | -0.35 | -0.66 | 47.72 | -0.32 | -0.67 |
| 676LRC | | 49.40 | -0.12 | -0.23 | 48.10 | 0.06 | 0.13 |
| 6NKVQR | | 49.68 | 0.15 | 0.29 | 47.91 | -0.13 | -0.28 |
| 79RF7R | | 49.70 | 0.18 | 0.33 | 48.20 | 0.16 | 0.34 |
| 7DHUQT | * | 50.20 | 0.68 | 1.27 | 47.40 | -0.64 | -1.33 |
| 84CCTV | | 50.20 | 0.68 | 1.27 | 48.80 | 0.76 | 1.59 |
| 8YFNCN | | 49.89 | 0.37 | 0.69 | 48.30 | 0.26 | 0.54 |
| 9UL26L | | 48.90 | -0.62 | -1.16 | 48.30 | 0.26 | 0.54 |
| AMZBAD | | 48.75 | -0.77 | -1.45 | 47.44 | -0.60 | -1.24 |
| BBJZ6K | | 48.70 | -0.82 | -1.53 | 48.10 | 0.06 | 0.13 |
| BP4HXN | | 49.30 | -0.22 | -0.41 | 47.80 | -0.24 | -0.50 |
| CCQRMV | | 49.50 | -0.02 | -0.04 | 47.90 | -0.14 | -0.29 |
| CMBYLN | | 49.75 | 0.23 | 0.42 | 48.01 | -0.03 | -0.07 |
| CNXXFD | * | 50.60 | 1.08 | 2.01 | 49.50 | 1.46 | 3.05 |
| DKGRGH | | 49.28 | -0.24 | -0.45 | 47.54 | -0.50 | -1.04 |
| EAC2CL | | 49.38 | -0.14 | -0.26 | 48.04 | 0.00 | -0.01 |
| F3CVGJ | | 48.80 | -0.72 | -1.35 | 47.30 | -0.74 | -1.54 |
| F4MUDD | | 49.60 | 0.08 | 0.15 | 48.30 | 0.26 | 0.54 |
| FFVMWD | | 49.33 | -0.19 | -0.36 | 47.83 | -0.20 | -0.43 |
| FVAVVV | X | 48.56 | -0.97 | -1.81 | 50.60 | 2.56 | 5.33 |
| FZJB6K | | 48.73 | -0.79 | -1.48 | 47.44 | -0.60 | -1.25 |
| G4X7KG | | 49.90 | 0.38 | 0.71 | 48.20 | 0.16 | 0.34 |
| GBJYWG | * | 50.60 | 1.08 | 2.01 | 47.70 | -0.34 | -0.71 |
| GMFXUE | | 49.80 | 0.28 | 0.52 | 48.20 | 0.16 | 0.34 |
| JEQ93F | | 49.51 | -0.01 | -0.02 | 47.98 | -0.06 | -0.12 |
| JJMR4E | | 50.00 | 0.48 | 0.89 | 48.40 | 0.36 | 0.75 |
| JLQNP3 | | 49.00 | -0.52 | -0.97 | 47.50 | -0.54 | -1.12 |
| KAVPJH | | 48.80 | -0.72 | -1.35 | 48.30 | 0.26 | 0.54 |
| KMWRFW | | 50.00 | 0.48 | 0.89 | 48.40 | 0.36 | 0.75 |
| KVU36A | | 49.20 | -0.32 | -0.60 | 47.80 | -0.24 | -0.50 |
| LCKF89 | X | 43.80 | -5.72 | -10.69 | 45.40 | -2.64 | -5.50 |
| MD6TZB | | 49.30 | -0.22 | -0.41 | 47.80 | -0.24 | -0.50 |
| MJ9V6B | | 49.80 | 0.28 | 0.52 | 48.20 | 0.16 | 0.34 |
| NEW9PC | | 49.30 | -0.22 | -0.41 | 47.80 | -0.24 | -0.50 |
| NKXKLA | | 48.90 | -0.62 | -1.16 | 48.30 | 0.26 | 0.54 |
| NZX8CB | * | 50.40 | 0.88 | 1.64 | 47.50 | -0.54 | -1.12 |
| P23ETA | | 50.20 | 0.68 | 1.27 | 48.20 | 0.16 | 0.34 |
| R82JXX | | 49.30 | -0.22 | -0.41 | 48.00 | -0.04 | -0.08 |
| RMFLG8 | | 50.00 | 0.48 | 0.89 | 48.70 | 0.66 | 1.38 |
| RXCRB7 | | 49.90 | 0.38 | 0.71 | 48.40 | 0.36 | 0.75 |
| T7QXM3 | | 49.75 | 0.23 | 0.42 | 48.30 | 0.26 | 0.54 |
| TP2QP6 | | 49.60 | 0.08 | 0.15 | 48.20 | 0.16 | 0.34 |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1101**

**Cycle 131
3rd Qtr 2020**

**Tensile Strength: Lab-Machined Flat Aluminum
ASTM B557**

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| U26QHZ | | 49.10 | -0.42 | -0.79 | 47.60 | -0.44 | -0.91 |
| ULWKM6 | | 48.70 | -0.82 | -1.53 | 47.50 | -0.54 | -1.12 |
| UXRLB7 | | 49.50 | -0.02 | -0.04 | 48.40 | 0.36 | 0.75 |
| V9MGGZ | | 49.69 | 0.17 | 0.31 | 47.53 | -0.51 | -1.06 |
| VWVTQ8 | | 49.86 | 0.34 | 0.63 | 49.11 | 1.07 | 2.23 |
| WFJFP2 | | 49.52 | 0.00 | -0.01 | 47.93 | -0.11 | -0.22 |
| X3483Z | | 48.60 | -0.92 | -1.72 | 47.30 | -0.74 | -1.54 |
| XDR442 | | 49.85 | 0.33 | 0.61 | 48.18 | 0.14 | 0.29 |
| YKNY2Y | | 50.10 | 0.58 | 1.08 | 48.60 | 0.56 | 1.17 |
| Z68MLB | | 49.40 | -0.12 | -0.23 | 47.60 | -0.44 | -0.91 |

Summary Statistics

| | Sample R69 | | Sample R70 | |
|---------------------------|------------|-----|------------|-----|
| Grand Means | 49.52 | ksi | 48.04 | ksi |
| Stnd Dev Btwn Labs | 0.54 | ksi | 0.48 | ksi |

Samples R69, R70 : 14G 6061-T6 (A), 12G 6061-T6 (B)

Statistics based on 55 of 57 reporting participants

Comments on Assigned Data Flags for Test #1101

- FVAVV (X) - Data for sample R70 are high.
- LCKF89 (X) - Data for both samples are low.



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1101

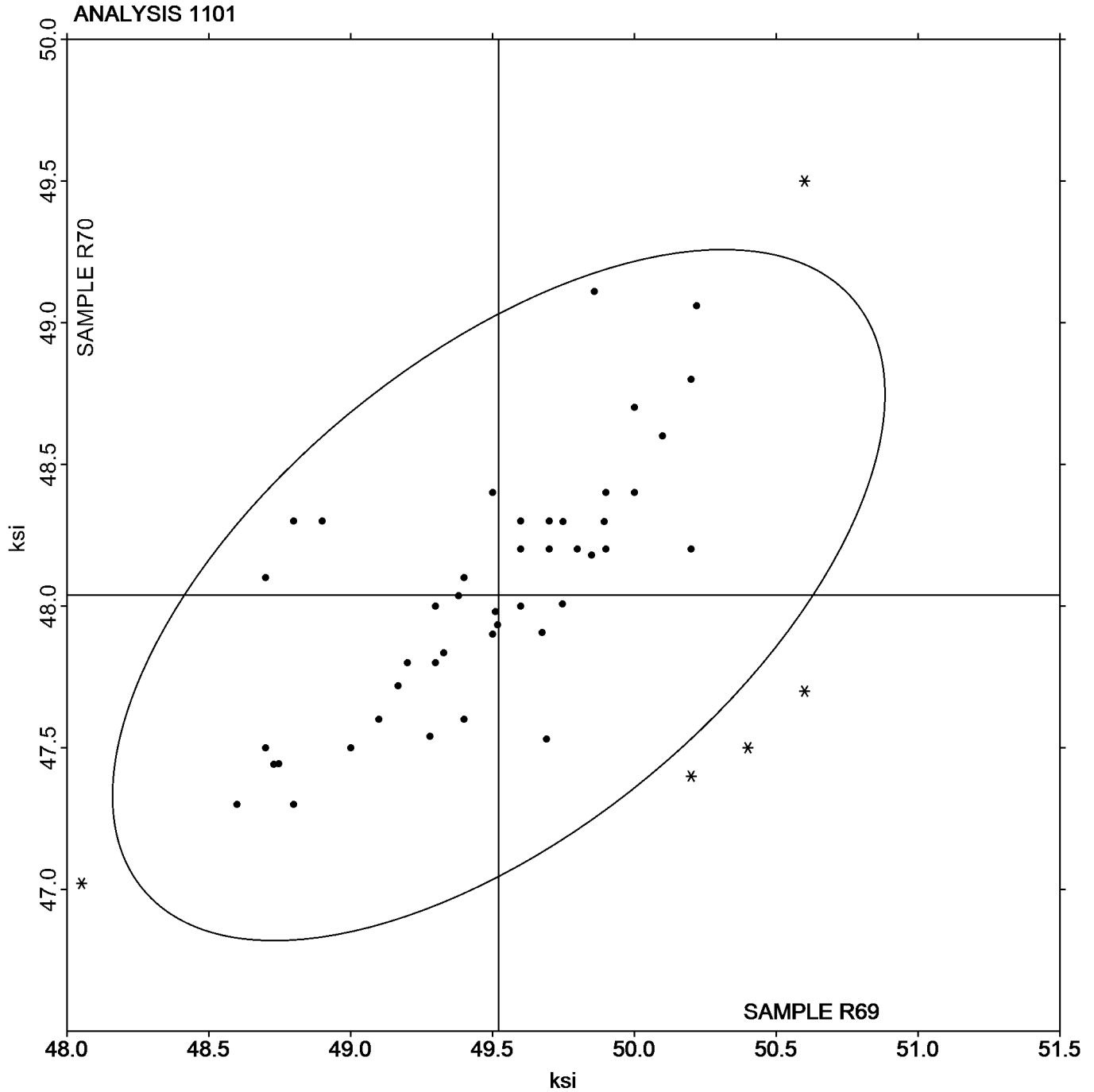
Tensile Strength: Lab-Machined Flat Aluminum
ASTM B557

SAMPLE R69

49.52 ksi

SAMPLE R70

48.04 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1102

Yield Strength: Lab-Machined Flat Aluminum
ASTM B557

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | | 41.50 | 0.05 | 0.08 | 40.60 | 0.08 | 0.15 |
| 2KJ9VT | | 40.25 | -1.21 | -2.01 | 39.93 | -0.59 | -1.12 |
| 47M9QU | | 42.00 | 0.55 | 0.91 | 40.70 | 0.18 | 0.34 |
| 4CCTUA | | 41.70 | 0.25 | 0.41 | 41.00 | 0.48 | 0.91 |
| 642Q7N | | 42.20 | 0.75 | 1.25 | 41.60 | 1.08 | 2.05 |
| 66RPM8 | | 41.19 | -0.26 | -0.44 | 40.61 | 0.09 | 0.17 |
| 676LRC | | 41.70 | 0.25 | 0.41 | 41.10 | 0.58 | 1.10 |
| 6NKVQR | | 41.70 | 0.25 | 0.41 | 40.35 | -0.17 | -0.33 |
| 79RF7R | | 41.70 | 0.25 | 0.41 | 40.90 | 0.38 | 0.72 |
| 7DHUQT | | 41.90 | 0.45 | 0.75 | 39.80 | -0.72 | -1.37 |
| 84CCTV | | 41.80 | 0.35 | 0.58 | 41.20 | 0.68 | 1.29 |
| 8YFNCN | | 42.21 | 0.75 | 1.26 | 41.05 | 0.52 | 0.99 |
| 9UL26L | | 40.60 | -0.85 | -1.42 | 40.60 | 0.08 | 0.15 |
| AMZBAD | | 40.45 | -1.00 | -1.67 | 39.89 | -0.64 | -1.21 |
| BBJZ6K | | 41.20 | -0.25 | -0.42 | 40.90 | 0.38 | 0.72 |
| BP4HXN | | 41.70 | 0.25 | 0.41 | 40.70 | 0.18 | 0.34 |
| CCQRMV | | 41.70 | 0.25 | 0.41 | 40.60 | 0.08 | 0.15 |
| CMBYLN | * | 40.61 | -0.84 | -1.41 | 39.16 | -1.36 | -2.58 |
| CNXXFD | | 42.40 | 0.95 | 1.58 | 41.70 | 1.18 | 2.24 |
| DKGRGH | * | 42.03 | 0.58 | 0.96 | 39.43 | -1.09 | -2.07 |
| EAC2CL | | 41.43 | -0.02 | -0.04 | 40.52 | 0.00 | 0.00 |
| F3CVGJ | | 40.50 | -0.95 | -1.59 | 40.00 | -0.52 | -0.99 |
| F4MUDD | | 41.80 | 0.35 | 0.58 | 41.20 | 0.68 | 1.29 |
| FFVMWD | | 41.03 | -0.42 | -0.70 | 40.41 | -0.11 | -0.22 |
| FZJB6K | | 40.58 | -0.87 | -1.46 | 40.15 | -0.37 | -0.71 |
| G4X7KG | | 41.90 | 0.45 | 0.75 | 40.80 | 0.28 | 0.53 |
| GBJYWG | * | 42.70 | 1.25 | 2.08 | 40.20 | -0.32 | -0.61 |
| GMFXUE | | 41.60 | 0.15 | 0.24 | 40.70 | 0.18 | 0.34 |
| JEQ93F | | 41.42 | -0.03 | -0.06 | 40.59 | 0.07 | 0.13 |
| JJMR4E | | 41.80 | 0.35 | 0.58 | 40.80 | 0.28 | 0.53 |
| JLQNP3 | | 41.10 | -0.35 | -0.59 | 40.30 | -0.22 | -0.42 |
| KAVPJH | | 40.80 | -0.65 | -1.09 | 40.90 | 0.38 | 0.72 |
| KMWRFW | | 41.00 | -0.45 | -0.76 | 39.80 | -0.72 | -1.37 |
| KVU36A | | 41.40 | -0.05 | -0.09 | 40.60 | 0.08 | 0.15 |
| LCKF89 | X | 35.80 | -5.65 | -9.44 | 35.20 | -5.32 | -10.10 |
| MD6TZB | | 41.90 | 0.45 | 0.75 | 40.70 | 0.18 | 0.34 |
| MJ9V6B | | 41.00 | -0.45 | -0.76 | 40.70 | 0.18 | 0.34 |
| NEW9PC | | 41.40 | -0.05 | -0.09 | 40.60 | 0.08 | 0.15 |
| NKXKLA | | 41.40 | -0.05 | -0.09 | 41.00 | 0.48 | 0.91 |
| NZX8CB | * | 42.40 | 0.95 | 1.58 | 40.00 | -0.52 | -0.99 |
| P23ETA | | 41.90 | 0.45 | 0.75 | 40.30 | -0.22 | -0.42 |
| R82JXX | | 41.20 | -0.25 | -0.42 | 40.40 | -0.12 | -0.23 |
| RMFLG8 | | 42.00 | 0.55 | 0.91 | 40.90 | 0.38 | 0.72 |
| RXCRB7 | | 42.00 | 0.55 | 0.91 | 41.00 | 0.48 | 0.91 |
| T7QXM3 | X | 26.54 | -14.91 | -24.90 | 21.32 | -19.20 | -36.44 |
| TP2QP6 | | 41.30 | -0.15 | -0.26 | 40.50 | -0.02 | -0.04 |
| U26QHZ | | 41.80 | 0.35 | 0.58 | 40.60 | 0.08 | 0.15 |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1102**

**Cycle 131
3rd Qtr 2020**

**Yield Strength: Lab-Machined Flat Aluminum
ASTM B557**

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| ULWKM6 | | 40.70 | -0.75 | -1.26 | 40.40 | -0.12 | -0.23 |
| UXRLB7 | | 41.40 | -0.05 | -0.09 | 41.10 | 0.58 | 1.10 |
| V9MGGZ | | 40.60 | -0.85 | -1.42 | 39.20 | -1.32 | -2.51 |
| VWVTQ8 | * | 39.92 | -1.53 | -2.56 | 39.95 | -0.57 | -1.08 |
| WFJFP2 | | 41.51 | 0.06 | 0.10 | 40.41 | -0.11 | -0.21 |
| X3483Z | | 40.80 | -0.65 | -1.09 | 39.80 | -0.72 | -1.37 |
| XDR442 | | 41.75 | 0.30 | 0.50 | 40.53 | 0.01 | 0.02 |
| YKNY2Y | | 42.10 | 0.65 | 1.08 | 41.00 | 0.48 | 0.91 |
| Z68MLB | | 41.80 | 0.35 | 0.58 | 40.30 | -0.22 | -0.42 |

Summary Statistics

| | Sample R69 | | Sample R70 | |
|----------------------------|------------|-----|------------|-----|
| Grand Means | 41.45 | ksi | 40.52 | ksi |
| Stnd Dev Btrwn Labs | 0.60 | ksi | 0.53 | ksi |

Samples R69, R70 : 14G 6061-T6 (A), 12G 6061-T6 (B)

Statistics based on 54 of 56 reporting participants

Comments on Assigned Data Flags for Test #1102

LCKF89 (X) - Data for both samples are low.

T7QXM3 (X) - Data for both samples are low.



Analysis 1102

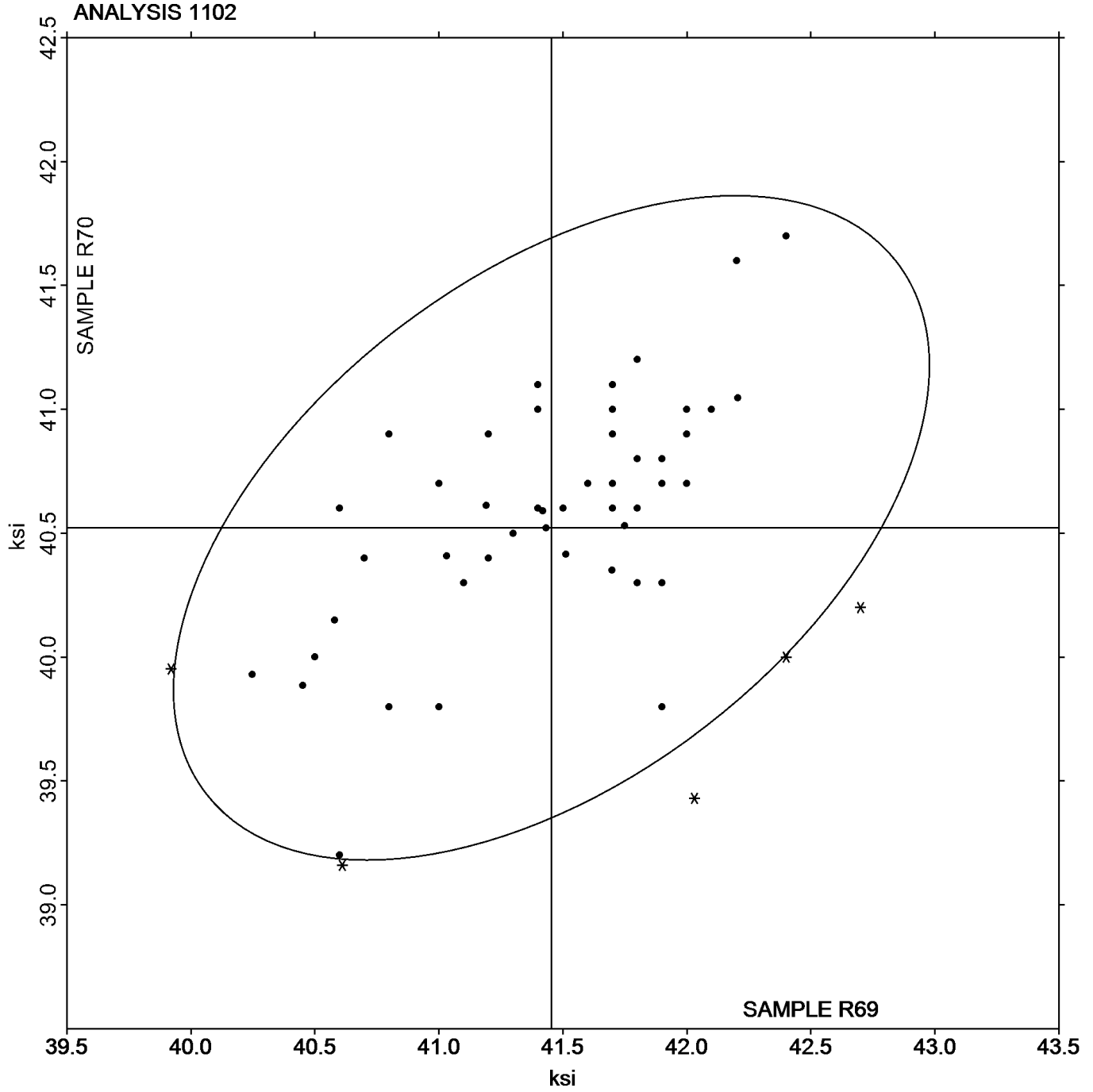
Yield Strength: Lab-Machined Flat Aluminum
ASTM B557

SAMPLE R69

41.45 ksi

SAMPLE R70

40.52 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1103

Elongation: Lab-Machined Flat Aluminum
ASTM B557

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | | 15.20 | -0.18 | -0.12 | 15.10 | -0.33 | -0.22 |
| 2KJ9VT | | 16.60 | 1.22 | 0.82 | 17.30 | 1.87 | 1.23 |
| 47M9QU | * | 11.40 | -3.98 | -2.68 | 11.50 | -3.93 | -2.59 |
| 4CCTUA | | 14.50 | -0.88 | -0.59 | 14.30 | -1.13 | -0.75 |
| 642Q7N | | 16.00 | 0.62 | 0.42 | 15.60 | 0.17 | 0.11 |
| 66RPM8 | | 15.60 | 0.22 | 0.15 | 15.80 | 0.37 | 0.24 |
| 676LRC | | 14.00 | -1.38 | -0.93 | 14.50 | -0.93 | -0.62 |
| 6NKVQR | | 16.90 | 1.52 | 1.03 | 16.65 | 1.22 | 0.80 |
| 79RF7R | | 16.70 | 1.32 | 0.89 | 16.90 | 1.47 | 0.97 |
| 7DHUQT | | 15.50 | 0.12 | 0.08 | 15.50 | 0.07 | 0.04 |
| 84CCTV | * | 11.20 | -4.18 | -2.81 | 11.60 | -3.83 | -2.53 |
| 8YFNCN | * | 11.00 | -4.38 | -2.94 | 10.70 | -4.73 | -3.12 |
| 9UL26L | X | 11.90 | -3.48 | -2.34 | 14.40 | -1.03 | -0.68 |
| AMZBAD | | 15.80 | 0.42 | 0.28 | 15.90 | 0.47 | 0.31 |
| BBJZ6K | | 14.50 | -0.88 | -0.59 | 13.50 | -1.93 | -1.27 |
| BP4HXN | | 16.30 | 0.92 | 0.62 | 16.60 | 1.17 | 0.77 |
| CCQRMV | | 15.90 | 0.52 | 0.35 | 16.00 | 0.57 | 0.37 |
| CMBYLN | | 15.50 | 0.12 | 0.08 | 16.20 | 0.77 | 0.50 |
| CNXXFD | * | 15.00 | -0.38 | -0.25 | 16.50 | 1.07 | 0.70 |
| DKGRGH | * | 17.70 | 2.32 | 1.56 | 16.50 | 1.07 | 0.70 |
| EAC2CL | | 16.00 | 0.62 | 0.42 | 16.00 | 0.57 | 0.37 |
| F3CVGJ | | 15.00 | -0.38 | -0.25 | 15.00 | -0.43 | -0.29 |
| F4MUDD | X | 14.60 | -0.78 | -0.52 | 16.60 | 1.17 | 0.77 |
| FFVMWD | | 15.30 | -0.08 | -0.05 | 15.50 | 0.07 | 0.04 |
| FZJB6K | | 17.58 | 2.20 | 1.48 | 18.04 | 2.61 | 1.72 |
| G4X7KG | | 14.50 | -0.88 | -0.59 | 14.50 | -0.93 | -0.62 |
| GBJYWG | | 16.50 | 1.12 | 0.76 | 16.50 | 1.07 | 0.70 |
| GMFXUE | | 15.50 | 0.12 | 0.08 | 15.50 | 0.07 | 0.04 |
| JEQ93F | | 14.90 | -0.48 | -0.32 | 15.00 | -0.43 | -0.29 |
| JJMR4E | | 14.00 | -1.38 | -0.93 | 14.00 | -1.43 | -0.94 |
| JLQNP3 | | 14.90 | -0.48 | -0.32 | 14.90 | -0.53 | -0.35 |
| KAVPJH | | 17.00 | 1.62 | 1.09 | 17.00 | 1.57 | 1.03 |
| KMWRFW | | 14.50 | -0.88 | -0.59 | 14.00 | -1.43 | -0.94 |
| KVU36A | | 15.80 | 0.42 | 0.28 | 16.00 | 0.57 | 0.37 |
| LCKF89 | | 15.80 | 0.42 | 0.28 | 15.20 | -0.23 | -0.15 |
| MD6TZB | | 14.50 | -0.88 | -0.59 | 14.50 | -0.93 | -0.62 |
| MJ9V6B | | 17.20 | 1.82 | 1.23 | 17.20 | 1.77 | 1.16 |
| NEW9PC | | 16.50 | 1.12 | 0.76 | 16.50 | 1.07 | 0.70 |
| NKXKLA | | 14.00 | -1.38 | -0.93 | 15.00 | -0.43 | -0.29 |
| NZX8CB | | 15.50 | 0.12 | 0.08 | 16.00 | 0.57 | 0.37 |
| P23ETA | | 15.50 | 0.12 | 0.08 | 15.50 | 0.07 | 0.04 |
| R82JXX | | 14.90 | -0.48 | -0.32 | 15.60 | 0.17 | 0.11 |
| RMFLG8 | | 15.00 | -0.38 | -0.25 | 15.50 | 0.07 | 0.04 |
| RXCRB7 | | 14.00 | -1.38 | -0.93 | 14.00 | -1.43 | -0.94 |
| T7QXM3 | * | 20.00 | 4.62 | 3.11 | 20.00 | 4.57 | 3.01 |
| TP2QP6 | | 15.50 | 0.12 | 0.08 | 16.00 | 0.57 | 0.37 |
| U26QHZ | | 15.70 | 0.32 | 0.22 | 15.70 | 0.27 | 0.18 |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1103**

**Cycle 131
3rd Qtr 2020**

**Elongation: Lab-Machined Flat Aluminum
ASTM B557**

| WebCode | Data Flag | Sample R69 | | | Sample R70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| ULWKM6 | | 15.00 | -0.38 | -0.25 | 15.00 | -0.43 | -0.29 |
| UXRLB7 | | 14.00 | -1.38 | -0.93 | 14.00 | -1.43 | -0.94 |
| V9MGGZ | * | 15.75 | 0.37 | 0.25 | 14.15 | -1.28 | -0.85 |
| VWVTQ8 | | 15.60 | 0.22 | 0.15 | 16.60 | 1.17 | 0.77 |
| WFJFP2 | | 16.20 | 0.82 | 0.55 | 15.40 | -0.03 | -0.02 |
| X3483Z | | 15.50 | 0.12 | 0.08 | 15.50 | 0.07 | 0.04 |
| XDR442 | | 15.70 | 0.32 | 0.22 | 15.80 | 0.37 | 0.24 |
| YKNY2Y | | 15.50 | 0.12 | 0.08 | 16.00 | 0.57 | 0.37 |
| Z68MLB | | 16.20 | 0.82 | 0.55 | 15.70 | 0.27 | 0.18 |

Summary Statistics

| | Sample R69 | | Sample R70 | |
|----------------------------|------------|---------|------------|---------|
| Grand Means | 15.38 | Percent | 15.43 | Percent |
| Stnd Dev Btrwn Labs | 1.49 | Percent | 1.52 | Percent |

Samples R69, R70 : 14G 6061-T6 (A), 12G 6061-T6 (B)

Statistics based on 54 of 56 reporting participants

Comments on Assigned Data Flags for Test #1103

9UL26L (X) - Inconsistent in testing between samples.

F4MUDD (X) - Inconsistent in testing between samples.



Analysis 1103

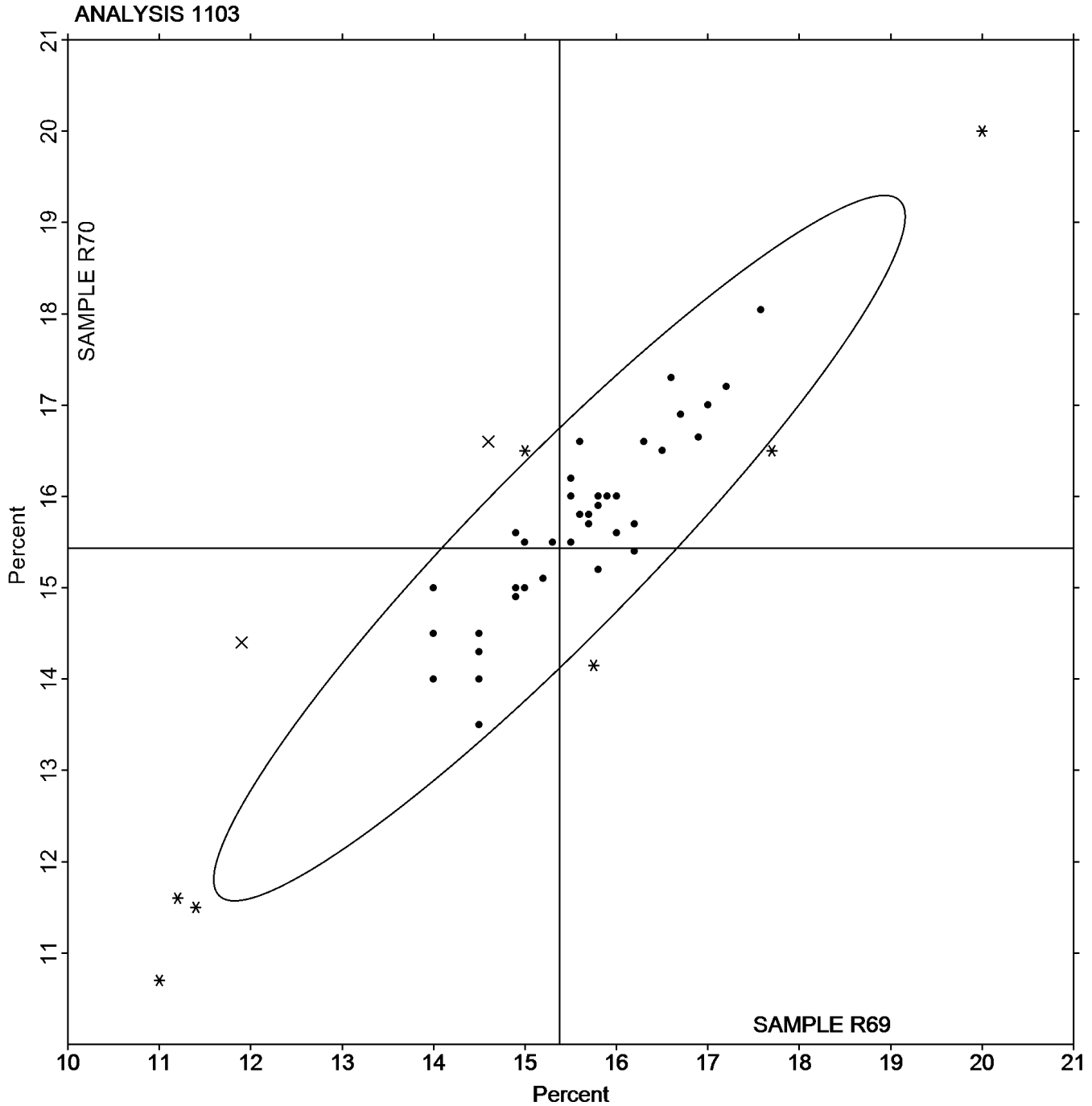
Elongation: Lab-Machined Flat Aluminum
ASTM B557

SAMPLE R69

15.38 Percent

SAMPLE R70

15.43 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1111

Tensile Strength: Pre-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | | 153.30 | 0.40 | 0.31 | 149.60 | 1.64 | 1.32 |
| 3FECCB | | 152.81 | -0.08 | -0.07 | 148.98 | 1.03 | 0.83 |
| 3H7BQA | | 150.72 | -2.18 | -1.68 | 145.92 | -2.04 | -1.64 |
| 4ZK2A7 | | 154.61 | 1.71 | 1.32 | 149.10 | 1.14 | 0.92 |
| 676LRC | | 154.00 | 1.10 | 0.85 | 148.00 | 0.04 | 0.03 |
| 6V34EN | | 153.83 | 0.93 | 0.72 | 147.47 | -0.49 | -0.39 |
| 7LXD97 | | 150.80 | -2.10 | -1.62 | 146.30 | -1.66 | -1.33 |
| 8Q4NHC | | 152.61 | -0.29 | -0.22 | 146.78 | -1.18 | -0.95 |
| 93BRKL | | 152.90 | 0.00 | 0.00 | 150.30 | 2.34 | 1.88 |
| 9E6BX7 | | 154.32 | 1.42 | 1.10 | 149.22 | 1.27 | 1.02 |
| 9QK6BK | | 153.00 | 0.10 | 0.08 | 147.20 | -0.76 | -0.61 |
| 9WPWNN | | 152.00 | -0.90 | -0.69 | 148.00 | 0.04 | 0.03 |
| AL7MVN | X | 158.09 | 5.19 | 4.01 | 153.16 | 5.20 | 4.18 |
| AV7GMR | | 151.95 | -0.94 | -0.73 | 148.77 | 0.81 | 0.65 |
| AY7PR3 | | 150.38 | -2.52 | -1.94 | 146.23 | -1.73 | -1.39 |
| B372M3 | | 151.25 | -1.65 | -1.27 | 146.97 | -0.99 | -0.79 |
| BBGFA4 | | 155.34 | 2.44 | 1.88 | 149.39 | 1.43 | 1.15 |
| BK66DJ | | 152.83 | -0.07 | -0.05 | 145.51 | -2.45 | -1.97 |
| CEUM73 | | 152.00 | -0.90 | -0.69 | 149.00 | 1.04 | 0.84 |
| CGY9X9 | | 153.89 | 0.99 | 0.76 | 147.94 | -0.02 | -0.01 |
| CTVAJP | | 155.20 | 2.30 | 1.78 | 149.40 | 1.44 | 1.16 |
| DGHB7A | | 152.10 | -0.80 | -0.62 | 146.50 | -1.46 | -1.17 |
| DJJEVB | | 153.66 | 0.76 | 0.59 | 147.49 | -0.46 | -0.37 |
| DKGRGH | | 153.91 | 1.01 | 0.78 | 148.87 | 0.91 | 0.73 |
| EJH4EX | | 153.20 | 0.30 | 0.23 | 147.80 | -0.16 | -0.13 |
| FCCRW7 | | 153.30 | 0.40 | 0.31 | 147.08 | -0.88 | -0.71 |
| FEZ4VC | | 155.20 | 2.30 | 1.78 | 150.80 | 2.84 | 2.29 |
| G4JUQJ | | 153.00 | 0.10 | 0.08 | 148.00 | 0.04 | 0.03 |
| G6BQFC | | 153.45 | 0.55 | 0.43 | 147.74 | -0.22 | -0.18 |
| GV7QXY | | 154.80 | 1.90 | 1.47 | 149.20 | 1.24 | 1.00 |
| HJ86DK | | 152.98 | 0.08 | 0.06 | 146.99 | -0.97 | -0.78 |
| HRF2TC | | 152.45 | -0.45 | -0.35 | 148.75 | 0.79 | 0.64 |
| HWUJ98 | X | 162.03 | 9.13 | 7.05 | 149.23 | 1.27 | 1.02 |
| J3CBVR | | 151.71 | -1.19 | -0.92 | 146.69 | -1.27 | -1.02 |
| JTDDAC | | 151.10 | -1.80 | -1.39 | 146.40 | -1.56 | -1.25 |
| KJMALA | | 153.12 | 0.22 | 0.17 | 149.30 | 1.34 | 1.08 |
| KMWRFW | | 154.00 | 1.10 | 0.85 | 147.00 | -0.96 | -0.77 |
| KNQHJP | | 152.03 | -0.87 | -0.67 | 147.16 | -0.80 | -0.64 |
| KRDXC7 | | 152.20 | -0.70 | -0.54 | 146.80 | -1.16 | -0.93 |
| L9GU7P | | 150.76 | -2.14 | -1.65 | 146.11 | -1.85 | -1.49 |
| LHLYY7 | | 152.30 | -0.60 | -0.46 | 147.90 | -0.06 | -0.05 |
| P93RQR | | 155.00 | 2.10 | 1.62 | 149.00 | 1.04 | 0.84 |
| QFDFZJ | | 151.30 | -1.60 | -1.23 | 147.15 | -0.81 | -0.65 |
| RA9VEZ | | 152.30 | -0.60 | -0.46 | 147.90 | -0.06 | -0.05 |
| REZ27H | | 153.00 | 0.10 | 0.08 | 147.90 | -0.06 | -0.05 |
| T8Z3ZR | | 152.15 | -0.75 | -0.58 | 146.49 | -1.47 | -1.18 |
| TJQYXJ | | 152.90 | 0.00 | 0.00 | 147.30 | -0.66 | -0.53 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1111

Tensile Strength: Pre-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| TTEQNH | | 155.15 | 2.25 | 1.74 | 148.29 | 0.33 | 0.27 |
| UN4W8R | | 153.89 | 0.99 | 0.76 | 147.50 | -0.45 | -0.36 |
| UPDZ23 | | 153.15 | 0.25 | 0.19 | 146.98 | -0.97 | -0.78 |
| V2L3Z7 | | 155.89 | 2.99 | 2.31 | 149.36 | 1.40 | 1.13 |
| VKXX6X | | 151.80 | -1.10 | -0.85 | 148.50 | 0.54 | 0.44 |
| VUYGLR | X | 149.36 | -3.54 | -2.73 | 152.99 | 5.03 | 4.04 |
| X2H7J7 | * | 151.09 | -1.81 | -1.40 | 149.42 | 1.46 | 1.18 |
| XG98EC | | 152.40 | -0.50 | -0.38 | 150.20 | 2.24 | 1.80 |
| XMCAZ6 | | 152.00 | -0.90 | -0.69 | 148.00 | 0.04 | 0.03 |
| XP64ZU | | 151.55 | -1.35 | -1.04 | 146.78 | -1.18 | -0.95 |
| YXEVZC | | 151.50 | -1.40 | -1.08 | 146.78 | -1.18 | -0.95 |
| ZC78RC | | 153.10 | 0.20 | 0.16 | 147.50 | -0.46 | -0.37 |
| ZF7FWM | | 152.40 | -0.50 | -0.38 | 150.20 | 2.24 | 1.80 |
| ZM9KVX | | 153.90 | 1.00 | 0.77 | 148.30 | 0.34 | 0.28 |
| ZNMREU | | 152.50 | -0.40 | -0.31 | 149.80 | 1.84 | 1.48 |
| ZRKBCL | | 153.90 | 1.00 | 0.78 | 147.41 | -0.55 | -0.44 |

Summary Statistics

| | Sample A69 | | Sample A70 | |
|---------------------------|------------|-----|------------|-----|
| Grand Means | 152.90 | ksi | 147.96 | ksi |
| Stnd Dev Brwn Labs | 1.30 | ksi | 1.24 | ksi |

Samples A69, A70 : AISI 4340 (L), AISI 4340 (S)

Statistics based on 60 of 63 reporting participants

Comments on Assigned Data Flags for Test #1111

- AL7MVN (X) - Data for both samples are high.
- HWUJ98 (X) - Data for sample A69 are high.
- VUYGLR (X) - Data appear to be transposed between samples.



Analysis 1111

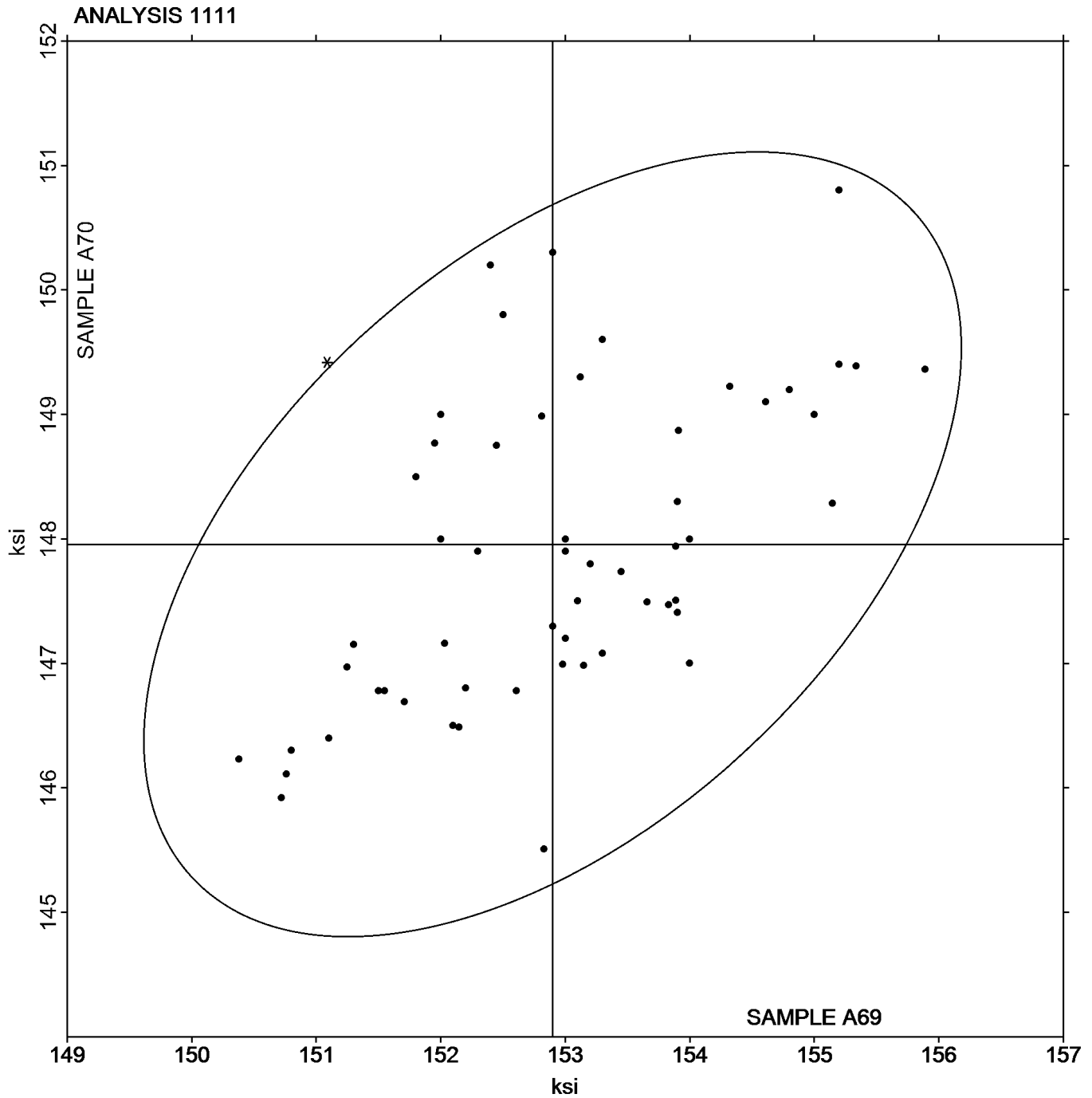
Tensile Strength: Pre-Machined Round Steel
ASTM E8

SAMPLE A69

152.90 ksi

SAMPLE A70

147.96 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1112

Yield Strength: Pre-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | | 127.30 | -1.64 | -0.91 | 121.20 | -0.22 | -0.13 |
| 3FECCB | | 130.10 | 1.16 | 0.64 | 123.76 | 2.34 | 1.42 |
| 3H7BQA | | 126.07 | -2.87 | -1.59 | 119.06 | -2.36 | -1.43 |
| 4ZK2A7 | | 131.26 | 2.32 | 1.28 | 122.85 | 1.43 | 0.86 |
| 676LRC | | 131.00 | 2.06 | 1.14 | 121.00 | -0.42 | -0.25 |
| 6V34EN | | 129.86 | 0.92 | 0.51 | 121.15 | -0.27 | -0.16 |
| 7LXD97 | | 126.80 | -2.14 | -1.19 | 120.00 | -1.42 | -0.86 |
| 8Q4NHC | | 129.11 | 0.17 | 0.09 | 120.82 | -0.60 | -0.37 |
| 93BRKL | | 128.60 | -0.34 | -0.19 | 123.50 | 2.08 | 1.26 |
| 9E6BX7 | | 131.06 | 2.11 | 1.17 | 121.87 | 0.45 | 0.27 |
| 9QK6BK | | 129.20 | 0.26 | 0.14 | 121.20 | -0.22 | -0.13 |
| 9WPWNN | | 129.00 | 0.06 | 0.03 | 120.00 | -1.42 | -0.86 |
| AL7MVN | X | 140.54 | 11.60 | 6.42 | 135.47 | 14.05 | 8.50 |
| AV7GMR | | 127.84 | -1.10 | -0.61 | 121.93 | 0.51 | 0.31 |
| AY7PR3 | | 125.52 | -3.42 | -1.89 | 119.52 | -1.90 | -1.15 |
| B372M3 | | 127.00 | -1.94 | -1.08 | 120.34 | -1.08 | -0.65 |
| BBGFA4 | | 131.55 | 2.61 | 1.44 | 122.85 | 1.43 | 0.86 |
| BK66DJ | | 129.26 | 0.32 | 0.18 | 118.85 | -2.57 | -1.56 |
| CEUM73 | | 128.40 | -0.54 | -0.30 | 123.50 | 2.08 | 1.26 |
| CGY9X9 | | 128.94 | 0.00 | 0.00 | 120.67 | -0.75 | -0.45 |
| CTVAJP | | 132.40 | 3.46 | 1.91 | 123.70 | 2.28 | 1.38 |
| DGHB7A | | 128.00 | -0.94 | -0.52 | 120.00 | -1.42 | -0.86 |
| DJJEVB | | 129.46 | 0.52 | 0.29 | 120.58 | -0.84 | -0.51 |
| DKGRGH | | 128.85 | -0.09 | -0.05 | 123.00 | 1.58 | 0.96 |
| EJH4EX | | 129.10 | 0.16 | 0.09 | 121.10 | -0.32 | -0.19 |
| FCCRW7 | | 129.12 | 0.18 | 0.10 | 120.29 | -1.13 | -0.69 |
| FEZ4VC | | 130.80 | 1.86 | 1.03 | 123.10 | 1.68 | 1.02 |
| G4JUQJ | | 130.00 | 1.06 | 0.58 | 122.00 | 0.58 | 0.35 |
| G6BQFC | | 127.20 | -1.74 | -0.97 | 119.70 | -1.72 | -1.04 |
| GV7QXY | | 131.70 | 2.76 | 1.53 | 122.00 | 0.58 | 0.35 |
| HJ86DK | * | 123.91 | -5.03 | -2.79 | 119.01 | -2.41 | -1.46 |
| HRF2TC | | 129.10 | 0.16 | 0.09 | 124.02 | 2.60 | 1.58 |
| HWUJ98 | | 129.50 | 0.56 | 0.31 | 122.60 | 1.18 | 0.71 |
| J3CBVR | | 127.99 | -0.95 | -0.53 | 119.36 | -2.06 | -1.25 |
| JTDDAC | | 127.50 | -1.44 | -0.80 | 120.90 | -0.52 | -0.32 |
| KJMALA | | 128.55 | -0.39 | -0.22 | 122.08 | 0.66 | 0.40 |
| KMWRFW | | 131.00 | 2.06 | 1.14 | 120.00 | -1.42 | -0.86 |
| KNQHJP | | 127.81 | -1.13 | -0.63 | 119.94 | -1.48 | -0.90 |
| KRDXC7 | | 129.20 | 0.26 | 0.14 | 121.40 | -0.02 | -0.01 |
| L9GU7P | | 126.96 | -1.98 | -1.10 | 119.33 | -2.09 | -1.27 |
| LHLYY7 | | 127.60 | -1.34 | -0.74 | 121.10 | -0.32 | -0.19 |
| P93RQR | | 132.00 | 3.06 | 1.69 | 122.00 | 0.58 | 0.35 |
| QFDFZJ | | 127.96 | -0.98 | -0.54 | 120.19 | -1.23 | -0.75 |
| RA9VEZ | | 127.30 | -1.64 | -0.91 | 120.80 | -0.62 | -0.38 |
| RE2Z7H | | 129.10 | 0.16 | 0.09 | 119.70 | -1.72 | -1.04 |
| T8Z3ZR | | 129.66 | 0.72 | 0.40 | 118.79 | -2.63 | -1.59 |
| TJQYXJ | * | 127.90 | -1.04 | -0.58 | 125.20 | 3.78 | 2.29 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1112

Yield Strength: Pre-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| TTEQNH | | 132.48 | 3.53 | 1.96 | 121.31 | -0.11 | -0.07 |
| UN4W8R | | 127.92 | -1.02 | -0.56 | 120.09 | -1.33 | -0.80 |
| UPDZ23 | | 132.27 | 3.32 | 1.84 | 122.63 | 1.21 | 0.73 |
| V2L3Z7 | | 131.57 | 2.63 | 1.45 | 123.03 | 1.61 | 0.97 |
| VKXX6X | | 128.40 | -0.54 | -0.30 | 122.90 | 1.48 | 0.90 |
| VUYGLR | X | 118.57 | -10.37 | -5.75 | 127.29 | 5.87 | 3.55 |
| X2H7J7 | | 125.30 | -3.64 | -2.02 | 120.56 | -0.86 | -0.52 |
| XG98EC | * | 128.90 | -0.04 | -0.02 | 125.30 | 3.88 | 2.35 |
| XMCAZ6 | | 128.00 | -0.94 | -0.52 | 121.00 | -0.42 | -0.25 |
| XP64ZU | X | 66.72 | -62.23 | -34.46 | 60.34 | -61.08 | -36.98 |
| YXEVZC | | 127.83 | -1.11 | -0.62 | 120.44 | -0.98 | -0.59 |
| ZC78RC | | 130.20 | 1.26 | 0.70 | 121.60 | 0.18 | 0.11 |
| ZF7FWM | | 129.70 | 0.76 | 0.42 | 125.40 | 3.98 | 2.41 |
| ZM9KVX | X | 131.00 | 2.06 | 1.14 | 131.60 | 10.18 | 6.16 |
| ZNMREU | | 128.20 | -0.74 | -0.41 | 123.20 | 1.78 | 1.08 |
| ZRKBCL | | 129.37 | 0.43 | 0.24 | 120.43 | -0.99 | -0.60 |

Summary Statistics

| | Sample A69 | | Sample A70 | |
|---------------------------|------------|-----|------------|-----|
| Grand Means | 128.94 | ksi | 121.42 | ksi |
| Stnd Dev Brwn Labs | 1.81 | ksi | 1.65 | ksi |

Samples A69, A70 : AISI 4340 (L), AISI 4340 (S)

Statistics based on 59 of 63 reporting participants

Comments on Assigned Data Flags for Test #1112

- AL7MVN (X) - Data for both samples are high.
- VUYGLR (X) - Data appear to be transposed between samples.
- XP64ZU (X) - Data for both samples are extremely low.
- ZM9KVX (X) - Data for sample A70 are high.

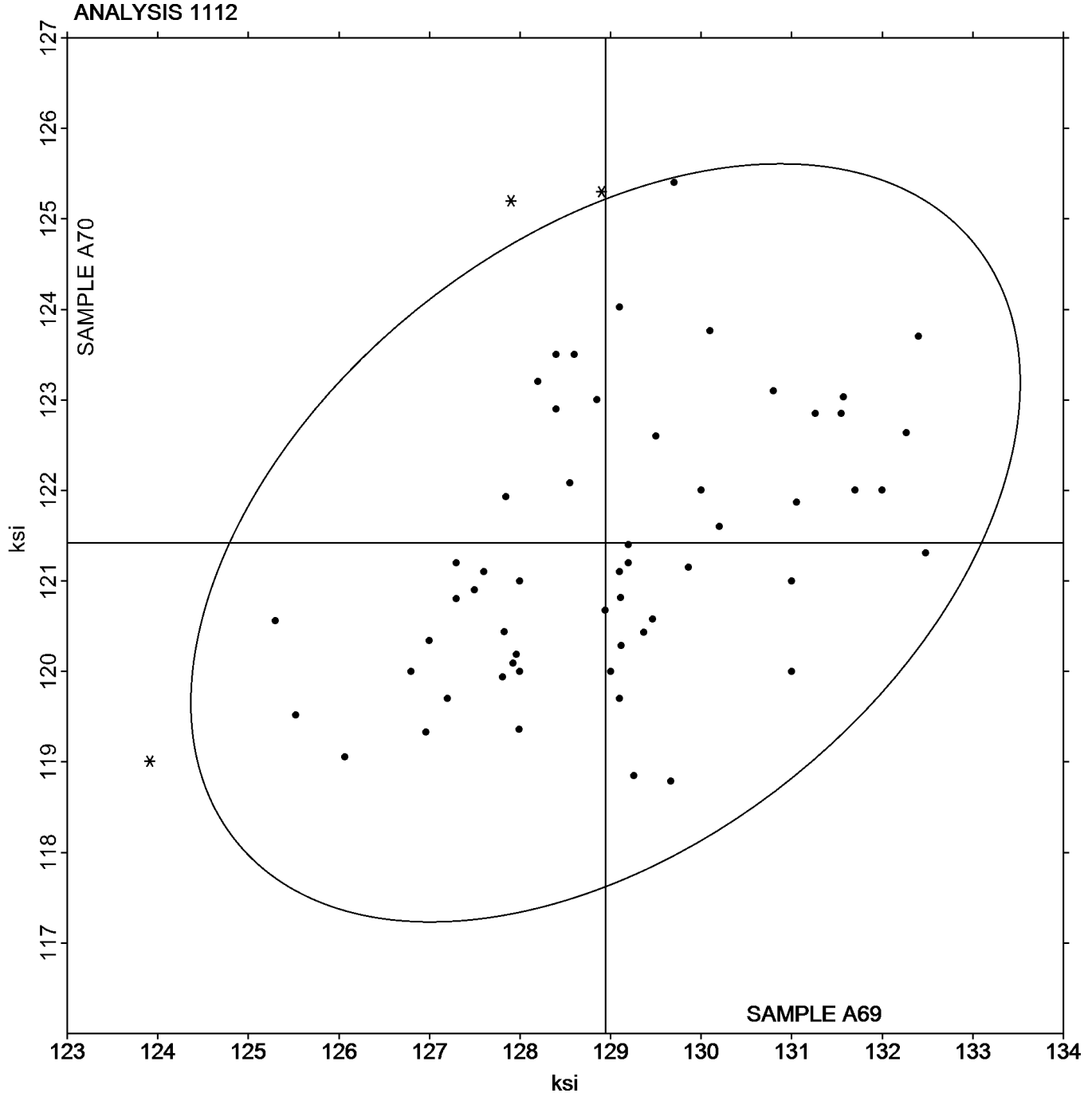


Analysis 1112

Yield Strength: Pre-Machined Round Steel
ASTM E8

SAMPLE A69
128.94 ksi

SAMPLE A70
121.42 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1113

Elongation: Pre-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2HPUX3 | * | 17.40 | 0.40 | 0.44 | 15.60 | -1.72 | -1.96 |
| 3FECCB | | 18.40 | 1.40 | 1.57 | 18.30 | 0.98 | 1.12 |
| 3H7BQA | | 16.86 | -0.14 | -0.16 | 17.55 | 0.23 | 0.26 |
| 4ZK2A7 | | 17.10 | 0.10 | 0.11 | 18.90 | 1.58 | 1.80 |
| 676LRC | | 15.00 | -2.00 | -2.25 | 16.00 | -1.32 | -1.51 |
| 6V34EN | | 17.00 | 0.00 | 0.00 | 18.00 | 0.68 | 0.78 |
| 7LXD97 | | 17.60 | 0.60 | 0.67 | 16.00 | -1.32 | -1.51 |
| 8Q4NHC | | 17.40 | 0.40 | 0.44 | 18.00 | 0.68 | 0.78 |
| 93BRKL | | 15.64 | -1.36 | -1.53 | 15.74 | -1.58 | -1.80 |
| 9E6BX7 | | 17.35 | 0.35 | 0.39 | 16.75 | -0.57 | -0.65 |
| 9QK6BK | | 17.20 | 0.20 | 0.22 | 18.00 | 0.68 | 0.78 |
| 9WPWNN | | 16.00 | -1.00 | -1.13 | 17.00 | -0.32 | -0.37 |
| AL7MVN | | 17.00 | 0.00 | 0.00 | 18.00 | 0.68 | 0.78 |
| AV7GMR | | 17.26 | 0.26 | 0.29 | 17.06 | -0.26 | -0.30 |
| AY7PR3 | | 17.99 | 0.99 | 1.11 | 17.46 | 0.14 | 0.16 |
| B372M3 | | 16.87 | -0.13 | -0.15 | 17.42 | 0.10 | 0.11 |
| BBGFA4 | | 15.60 | -1.40 | -1.57 | 15.90 | -1.42 | -1.62 |
| BK66DJ | | 17.40 | 0.40 | 0.44 | 18.20 | 0.88 | 1.00 |
| CEUM73 | | 16.65 | -0.35 | -0.40 | 17.00 | -0.32 | -0.37 |
| CGY9X9 | | 16.30 | -0.70 | -0.79 | 17.70 | 0.38 | 0.43 |
| CTVAJP | | 17.50 | 0.50 | 0.56 | 17.80 | 0.48 | 0.55 |
| DGHB7A | * | 15.20 | -1.80 | -2.02 | 17.80 | 0.48 | 0.55 |
| DJJEVB | | 16.20 | -0.80 | -0.90 | 18.10 | 0.78 | 0.89 |
| DKGRGH | | 17.00 | 0.00 | 0.00 | 18.00 | 0.68 | 0.78 |
| EJH4EX | | 17.10 | 0.10 | 0.11 | 17.60 | 0.28 | 0.32 |
| FCCRW7 | | 17.00 | 0.00 | 0.00 | 17.00 | -0.32 | -0.37 |
| FEZ4VC | | 15.50 | -1.50 | -1.69 | 15.20 | -2.12 | -2.42 |
| G4JUQJ | | 18.00 | 1.00 | 1.12 | 17.00 | -0.32 | -0.37 |
| G6BQFC | | 17.04 | 0.04 | 0.04 | 16.92 | -0.40 | -0.46 |
| GV7QXY | | 15.80 | -1.20 | -1.35 | 16.60 | -0.72 | -0.82 |
| HJ86DK | | 17.70 | 0.70 | 0.78 | 17.10 | -0.22 | -0.25 |
| HRF2TC | | 17.20 | 0.20 | 0.22 | 17.70 | 0.38 | 0.43 |
| HWUJ98 | X | 12.60 | -4.40 | -4.94 | 16.50 | -0.82 | -0.94 |
| J3CBVR | | 17.83 | 0.83 | 0.93 | 17.92 | 0.60 | 0.69 |
| JTDDAC | | 17.20 | 0.20 | 0.22 | 18.30 | 0.98 | 1.12 |
| KJMALA | | 17.20 | 0.20 | 0.22 | 17.75 | 0.43 | 0.49 |
| KMWRFW | | 16.00 | -1.00 | -1.13 | 16.00 | -1.32 | -1.51 |
| KNQHJP | | 17.87 | 0.87 | 0.97 | 17.28 | -0.04 | -0.05 |
| KRDXC7 | | 16.90 | -0.10 | -0.12 | 17.90 | 0.58 | 0.66 |
| L9GU7P | | 18.00 | 1.00 | 1.12 | 18.24 | 0.92 | 1.05 |
| LHLYY7 | | 17.70 | 0.70 | 0.78 | 17.70 | 0.38 | 0.43 |
| P93RQR | | 17.00 | 0.00 | 0.00 | 17.00 | -0.32 | -0.37 |
| QFDFZJ | | 18.19 | 1.19 | 1.33 | 18.27 | 0.95 | 1.08 |
| RA9VEZ | | 17.00 | 0.00 | 0.00 | 18.00 | 0.68 | 0.78 |
| RE2Z7H | | 16.80 | -0.20 | -0.23 | 16.50 | -0.82 | -0.94 |
| T8Z3ZR | | 17.10 | 0.10 | 0.11 | 18.80 | 1.48 | 1.69 |
| TJQYXJ | | 15.30 | -1.70 | -1.91 | 16.00 | -1.32 | -1.51 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1113

Elongation: Pre-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| TTEQNH | | 17.30 | 0.30 | 0.33 | 17.20 | -0.12 | -0.14 |
| UN4W8R | | 16.90 | -0.10 | -0.12 | 17.10 | -0.22 | -0.25 |
| UPDZ23 | | 17.66 | 0.66 | 0.74 | 17.80 | 0.48 | 0.55 |
| V2L3Z7 | | 16.70 | -0.30 | -0.34 | 17.10 | -0.22 | -0.25 |
| VKXX6X | | 16.70 | -0.30 | -0.34 | 17.00 | -0.32 | -0.37 |
| VUYGLR | | 18.80 | 1.80 | 2.01 | 17.80 | 0.48 | 0.55 |
| X2H7J7 | | 16.50 | -0.50 | -0.56 | 16.00 | -1.32 | -1.51 |
| XG98EC | | 18.00 | 1.00 | 1.12 | 18.00 | 0.68 | 0.78 |
| XMCAZ6 | | 16.00 | -1.00 | -1.13 | 16.00 | -1.32 | -1.51 |
| XP64ZU | | 16.90 | -0.10 | -0.12 | 17.80 | 0.48 | 0.55 |
| YXEVZC | | 18.00 | 1.00 | 1.12 | 18.31 | 0.99 | 1.13 |
| ZC78RC | X | 18.20 | 1.20 | 1.34 | 20.80 | 3.48 | 3.97 |
| ZF7FWM | | 16.90 | -0.10 | -0.12 | 17.00 | -0.32 | -0.37 |
| ZM9KVX | * | 19.60 | 2.60 | 2.91 | 18.60 | 1.28 | 1.46 |
| ZNMREU | | 16.39 | -0.61 | -0.69 | 15.79 | -1.53 | -1.75 |
| ZRKBCL | | 15.53 | -1.47 | -1.65 | 17.96 | 0.64 | 0.73 |

Summary Statistics

| | Sample A69 | | Sample A70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 17.00 | Percent | 17.32 | Percent |
| Stnd Dev Brwn Labs | 0.89 | Percent | 0.88 | Percent |

Samples A69, A70 : AISI 4340 (L), AISI 4340 (S)

Statistics based on 61 of 63 reporting participants

Comments on Assigned Data Flags for Test #1113

HWUJ98 (X) - Data for sample A69 are low.

ZC78RC (X) - Data for sample A70 are high.



Analysis 1113

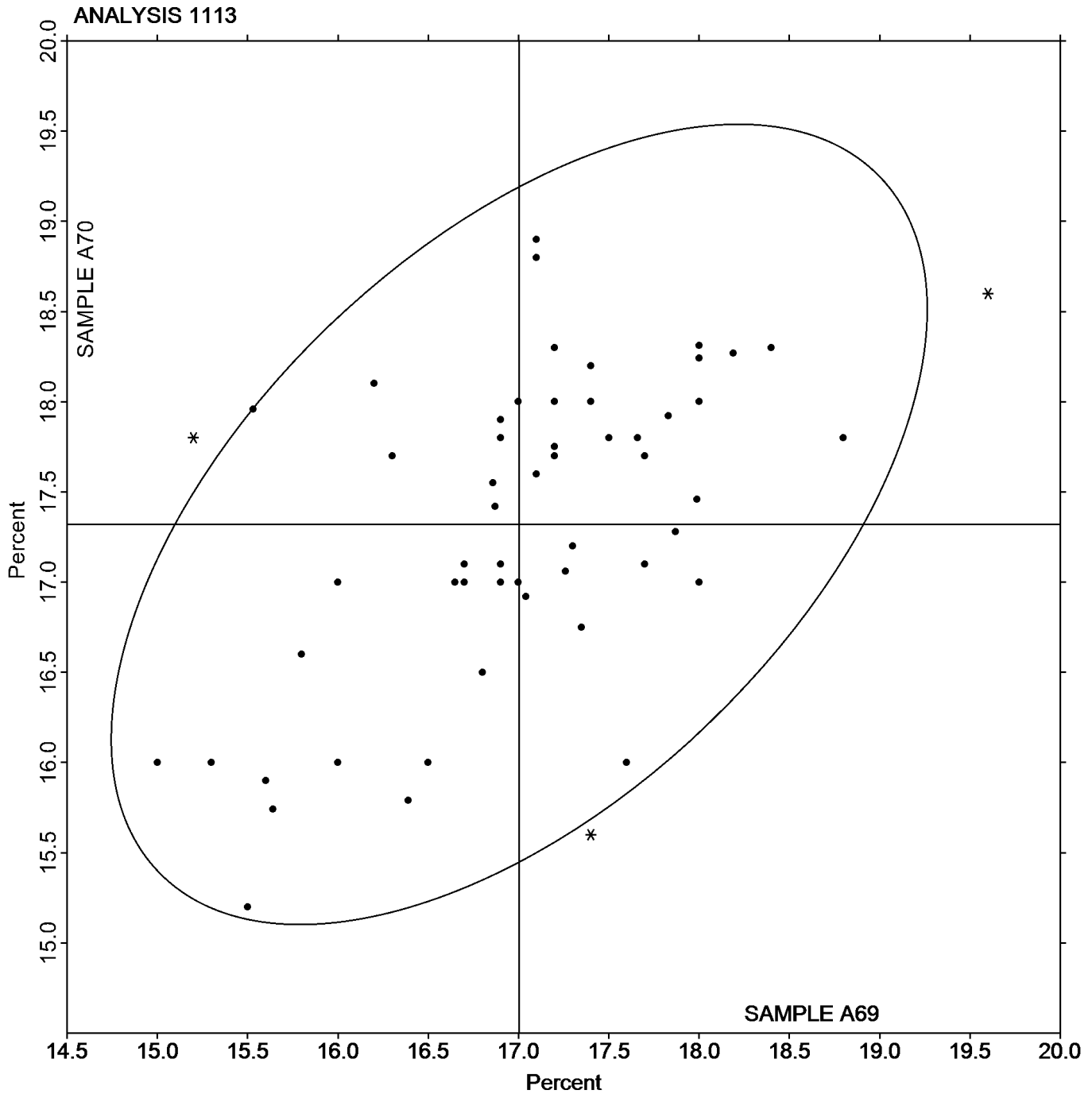
Elongation: Pre-Machined Round Steel
ASTM E8

SAMPLE A69

17.00 Percent

SAMPLE A70

17.32 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1114

Reduction of Area: Pre-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 3FECCB | | 56.00 | 2.25 | 0.89 | 55.50 | 2.04 | 0.80 |
| 3H7BQA | | 51.80 | -1.95 | -0.77 | 53.50 | 0.04 | 0.02 |
| 4ZK2A7 | | 52.00 | -1.75 | -0.69 | 56.00 | 2.54 | 0.99 |
| 676LRC | | 57.00 | 3.25 | 1.29 | 56.00 | 2.54 | 0.99 |
| 6V34EN | | 53.00 | -0.75 | -0.30 | 54.00 | 0.54 | 0.21 |
| 7LXD97 | | 54.30 | 0.55 | 0.22 | 50.50 | -2.96 | -1.15 |
| 8Q4NHC | | 51.80 | -1.95 | -0.77 | 56.50 | 3.04 | 1.19 |
| 93BRKL | * | 48.08 | -5.67 | -2.25 | 47.58 | -5.88 | -2.29 |
| 9E6BX7 | | 54.24 | 0.49 | 0.19 | 49.21 | -4.25 | -1.66 |
| 9QK6BK | | 53.00 | -0.75 | -0.30 | 54.00 | 0.54 | 0.21 |
| 9WPWNN | | 57.00 | 3.25 | 1.29 | 55.00 | 1.54 | 0.60 |
| AL7MVN | | 50.00 | -3.75 | -1.49 | 50.00 | -3.46 | -1.35 |
| AV7GMR | | 53.65 | -0.10 | -0.04 | 50.13 | -3.33 | -1.30 |
| AY7PR3 | | 55.60 | 1.85 | 0.73 | 53.50 | 0.04 | 0.02 |
| B372M3 | | 53.80 | 0.05 | 0.02 | 52.80 | -0.66 | -0.26 |
| BBGFA4 | | 52.00 | -1.75 | -0.69 | 49.00 | -4.46 | -1.74 |
| BK66DJ | | 52.80 | -0.95 | -0.38 | 54.70 | 1.24 | 0.49 |
| CEUM73 | | 57.70 | 3.95 | 1.57 | 58.30 | 4.84 | 1.89 |
| CGY9X9 | | 54.00 | 0.25 | 0.10 | 54.90 | 1.44 | 0.56 |
| CTVAJP | X | 25.90 | -27.85 | -11.03 | 54.90 | 1.44 | 0.56 |
| DGHB7A | X | 47.10 | -6.65 | -2.63 | 57.90 | 4.44 | 1.73 |
| DJJEVB | | 52.90 | -0.85 | -0.34 | 56.00 | 2.54 | 0.99 |
| DKGRGH | | 51.75 | -2.00 | -0.79 | 53.31 | -0.15 | -0.06 |
| EJH4EX | | 53.10 | -0.65 | -0.26 | 56.20 | 2.74 | 1.07 |
| FCCRW7 | | 53.00 | -0.75 | -0.30 | 54.00 | 0.54 | 0.21 |
| FEZ4VC | | 50.70 | -3.05 | -1.21 | 49.30 | -4.16 | -1.62 |
| G4JUQJ | * | 59.00 | 5.25 | 2.08 | 53.00 | -0.46 | -0.18 |
| G6BQFC | | 54.02 | 0.27 | 0.11 | 51.99 | -1.47 | -0.57 |
| GV7QXY | * | 47.10 | -6.65 | -2.63 | 48.50 | -4.96 | -1.93 |
| HJ86DK | | 56.34 | 2.59 | 1.03 | 54.48 | 1.02 | 0.40 |
| HRF2TC | | 49.70 | -4.05 | -1.60 | 51.40 | -2.06 | -0.80 |
| HWUJ98 | | 56.00 | 2.25 | 0.89 | 56.00 | 2.54 | 0.99 |
| J3CBVR | | 55.10 | 1.35 | 0.54 | 53.50 | 0.04 | 0.02 |
| JTDDAC | | 51.90 | -1.85 | -0.73 | 54.30 | 0.84 | 0.33 |
| KJMALA | | 50.07 | -3.68 | -1.46 | 54.48 | 1.02 | 0.40 |
| KMWRFW | | 56.00 | 2.25 | 0.89 | 54.00 | 0.54 | 0.21 |
| KNQHJP | | 55.70 | 1.95 | 0.77 | 52.90 | -0.56 | -0.22 |
| KRDXC7 | | 52.50 | -1.25 | -0.49 | 53.70 | 0.24 | 0.10 |
| L9GU7P | | 57.00 | 3.25 | 1.29 | 57.10 | 3.64 | 1.42 |
| LHLYY7 | | 55.40 | 1.65 | 0.65 | 54.20 | 0.74 | 0.29 |
| P93RQR | | 54.20 | 0.45 | 0.18 | 52.70 | -0.76 | -0.29 |
| QFDFZJ | | 57.80 | 4.05 | 1.61 | 56.30 | 2.84 | 1.11 |
| RA9VEZ | | 54.00 | 0.25 | 0.10 | 55.00 | 1.54 | 0.60 |
| RE2Z7H | | 58.70 | 4.95 | 1.96 | 55.50 | 2.04 | 0.80 |
| T8Z3ZR | | 52.90 | -0.85 | -0.34 | 57.20 | 3.74 | 1.46 |
| TJQYXJ | | 51.30 | -2.45 | -0.97 | 55.10 | 1.64 | 0.64 |
| TTEQNH | | 56.30 | 2.55 | 1.01 | 53.40 | -0.06 | -0.02 |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1114**

**Cycle 131
3rd Qtr 2020**

**Reduction of Area: Pre-Machined Round Steel
ASTM E8**

| WebCode | Data Flag | Sample A69 | | | Sample A70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| UN4W8R | | 55.00 | 1.25 | 0.50 | 55.00 | 1.54 | 0.60 |
| UPDZ23 | | 55.66 | 1.91 | 0.76 | 54.17 | 0.71 | 0.28 |
| V2L3Z7 | | 52.90 | -0.85 | -0.34 | 53.00 | -0.46 | -0.18 |
| VKXX6X | | 51.00 | -2.75 | -1.09 | 48.80 | -4.66 | -1.82 |
| VUYGLR | | 53.40 | -0.35 | -0.14 | 50.00 | -3.46 | -1.35 |
| X2H7J7 | | 52.00 | -1.75 | -0.69 | 51.50 | -1.96 | -0.76 |
| XG98EC | | 55.00 | 1.25 | 0.50 | 56.00 | 2.54 | 0.99 |
| XMCAZ6 | | 52.00 | -1.75 | -0.69 | 51.00 | -2.46 | -0.96 |
| XP64ZU | X | 31.90 | -21.85 | -8.66 | 32.00 | -21.46 | -8.37 |
| YXEVZC | | 56.60 | 2.85 | 1.13 | 55.90 | 2.44 | 0.95 |
| ZC78RC | | 52.90 | -0.85 | -0.34 | 55.60 | 2.14 | 0.84 |
| ZF7FWM | | 52.80 | -0.95 | -0.38 | 52.90 | -0.56 | -0.22 |
| ZM9KVX | | 56.40 | 2.65 | 1.05 | 54.00 | 0.54 | 0.21 |
| ZNMREU | | 51.47 | -2.28 | -0.90 | 47.87 | -5.59 | -2.18 |
| ZRKBCL | X | 48.64 | -5.10 | -2.02 | 57.18 | 3.73 | 1.45 |

Summary Statistics

| | Sample A69 | | Sample A70 | |
|--------------------------|------------|---------|------------|---------|
| Grand Means | 53.75 | Percent | 53.46 | Percent |
| Std Dev Btwn Labs | 2.52 | Percent | 2.56 | Percent |

Samples A69, A70 : AISI 4340 (L), AISI 4340 (S)

Statistics based on 58 of 62 reporting participants

Comments on Assigned Data Flags for Test #1114

- CTVAJP (X) - Data for sample A69 are low.
- DGHB7A (X) - Inconsistent in testing between samples.
- XP64ZU (X) - Data for both samples are low.
- ZRKBCL (X) - Inconsistent in testing between samples.



Analysis 1114

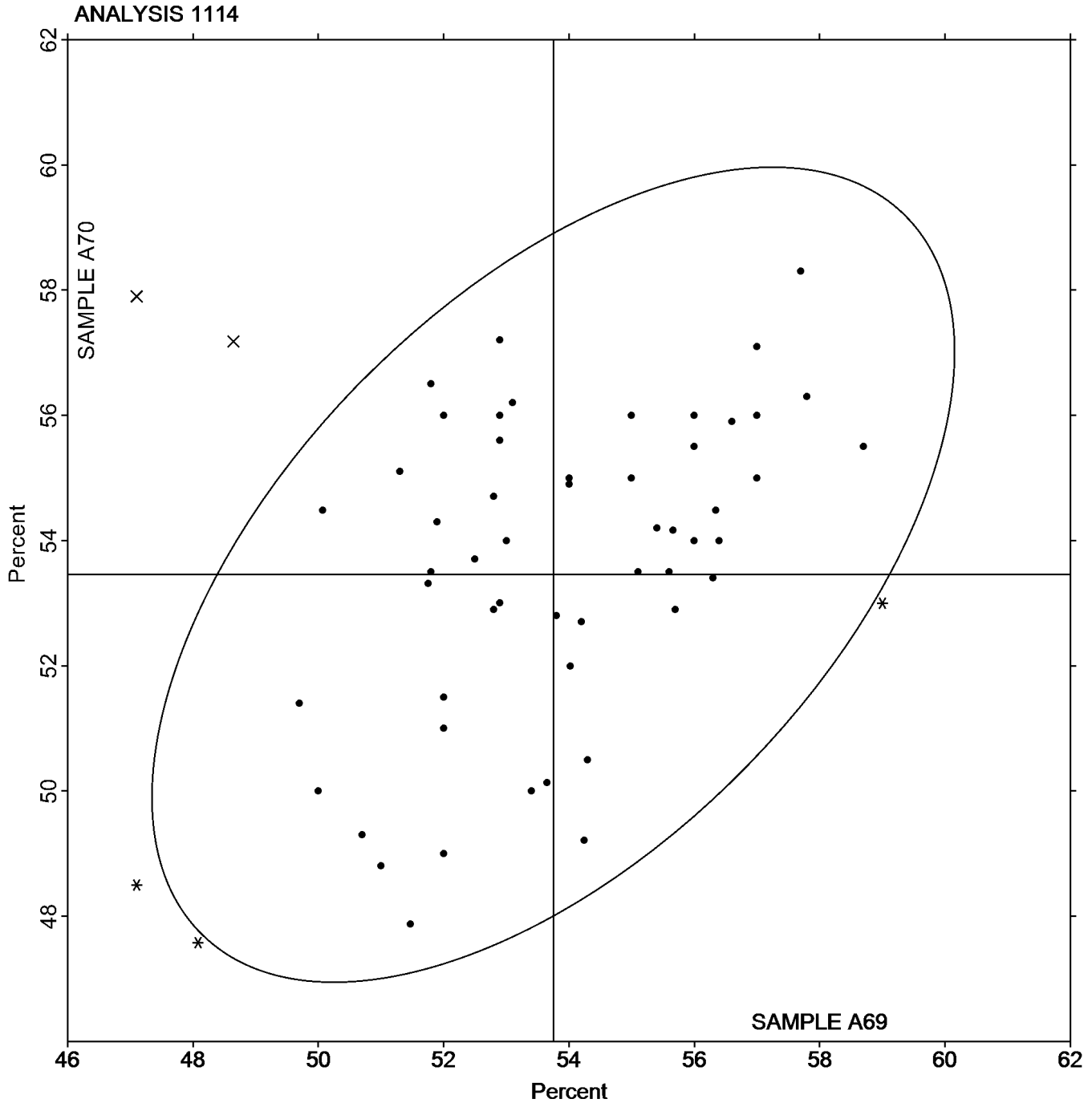
Reduction of Area: Pre-Machined Round Steel
ASTM E8

SAMPLE A69

53.75 Percent

SAMPLE A70

53.46 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1121

Tensile Strength: Lab-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------------|-----------------------|-------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 27VDBL | * | 147.80 | -0.36 | -0.28 | 155.30 | 2.88 | 1.99 |
| 2GKXZT | | 148.60 | 0.44 | 0.35 | 152.10 | -0.32 | -0.22 |
| 2H9FTD | | 148.87 | 0.71 | 0.56 | 153.35 | 0.93 | 0.64 |
| 2J6V3P | X | 152.30 | 4.14 | 3.26 | 146.70 | -5.72 | -3.94 |
| 2KJ9VT | | 146.65 | -1.51 | -1.19 | 152.29 | -0.12 | -0.09 |
| 2NF49Z | | 147.94 | -0.22 | -0.17 | 152.87 | 0.46 | 0.31 |
| 39FPLC | X | 153.60 | 5.44 | 4.29 | 149.60 | -2.82 | -1.94 |
| 3L3WFR | | 146.17 | -1.99 | -1.57 | 152.10 | -0.31 | -0.22 |
| 3TLX3V | X | 154.54 | 6.38 | 5.03 | 147.35 | -5.07 | -3.50 |
| 4434EQ | X | 149.50 | 1.34 | 1.06 | 135.70 | -16.72 | -11.53 |
| 4PJJUW | | 146.20 | -1.96 | -1.54 | 150.84 | -1.58 | -1.09 |
| 4R9PBM | | 147.21 | -0.94 | -0.74 | 152.44 | 0.02 | 0.01 |
| 4RRTNE | | 148.00 | -0.16 | -0.12 | 152.00 | -0.42 | -0.29 |
| 4XEJBA | | 148.52 | 0.36 | 0.29 | 150.26 | -2.16 | -1.49 |
| 6RLRKT | | 147.40 | -0.76 | -0.60 | 150.10 | -2.32 | -1.60 |
| 6TZ4EQ | | 147.80 | -0.36 | -0.28 | 150.40 | -2.02 | -1.39 |
| 6UA9RF | | 147.80 | -0.36 | -0.28 | 153.20 | 0.78 | 0.54 |
| 82M4LE | | 147.30 | -0.86 | -0.67 | 153.50 | 1.08 | 0.75 |
| 83HLMF | X | 143.00 | -5.16 | -4.06 | 154.00 | 1.58 | 1.09 |
| 8YWW6N | | 145.76 | -2.39 | -1.88 | 152.29 | -0.12 | -0.09 |
| 8ZRF8P | | 146.85 | -1.31 | -1.03 | 151.99 | -0.43 | -0.29 |
| 9FJHL9 | | 148.40 | 0.24 | 0.19 | 152.90 | 0.48 | 0.33 |
| 9WPWNN | | 147.00 | -1.16 | -0.91 | 149.00 | -3.42 | -2.36 |
| A7RJ6M | | 150.60 | 2.44 | 1.92 | 153.50 | 1.08 | 0.75 |
| A8KC3R | | 148.96 | 0.80 | 0.63 | 151.86 | -0.56 | -0.39 |
| A9UGFF | | 149.90 | 1.74 | 1.37 | 154.80 | 2.38 | 1.64 |
| BFCA6K | | 149.20 | 1.04 | 0.82 | 153.70 | 1.28 | 0.89 |
| BMVF2Q | | 149.23 | 1.07 | 0.85 | 155.19 | 2.78 | 1.91 |
| BP4HXN | | 147.90 | -0.26 | -0.20 | 151.60 | -0.82 | -0.56 |
| BPXDE6 | | 146.70 | -1.46 | -1.15 | 152.60 | 0.18 | 0.13 |
| CJMKXE | M | No Data Reported | | | 153.31 | 0.89 | 0.61 |
| DJJEVB | * | 149.23 | 1.07 | 0.84 | 156.13 | 3.71 | 2.56 |
| DKGRGH | | 149.11 | 0.95 | 0.75 | 154.53 | 2.11 | 1.46 |
| EEQPWH | X | 153.31 | 5.15 | 4.05 | 150.84 | -1.58 | -1.09 |
| EFHXWL | | 146.92 | -1.23 | -0.97 | 152.00 | -0.41 | -0.29 |
| EQWRAZ | | 149.42 | 1.26 | 0.99 | 152.70 | 0.28 | 0.19 |
| EXW8Y8 | | 148.66 | 0.51 | 0.40 | 153.60 | 1.18 | 0.81 |
| F862TZ | | 148.30 | 0.14 | 0.11 | 153.20 | 0.78 | 0.54 |
| F8KKDX | * | 149.70 | 1.54 | 1.22 | 150.60 | -1.82 | -1.25 |
| FCCRW7 | | 148.44 | 0.28 | 0.22 | 154.09 | 1.67 | 1.15 |
| GMFXUE | | 147.60 | -0.56 | -0.44 | 151.40 | -1.02 | -0.70 |
| GV7QXY | | 148.00 | -0.16 | -0.12 | 152.10 | -0.32 | -0.22 |
| GXVWGA | * | 151.38 | 3.22 | 2.54 | 154.16 | 1.74 | 1.20 |
| H7YQN8 | | 148.40 | 0.24 | 0.19 | 153.10 | 0.68 | 0.47 |
| J8BMTC | X | 153.70 | 5.54 | 4.36 | 147.50 | -4.92 | -3.39 |
| JXMQUW | | 148.60 | 0.44 | 0.35 | 153.50 | 1.08 | 0.75 |
| KAVPJH | | 147.00 | -1.16 | -0.91 | 150.00 | -2.42 | -1.67 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1121

Tensile Strength: Lab-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| LYWBYC | X | 167.10 | 18.94 | 14.92 | 169.40 | 16.98 | 11.71 |
| M2CEW8 | | 148.38 | 0.22 | 0.18 | 153.63 | 1.21 | 0.84 |
| MLG3CA | | 148.80 | 0.64 | 0.51 | 152.30 | -0.12 | -0.08 |
| MN6JJW | | 148.30 | 0.14 | 0.11 | 152.70 | 0.28 | 0.20 |
| MVPJYA | | 147.79 | -0.36 | -0.28 | 151.13 | -1.29 | -0.89 |
| MWHDWE | | 148.10 | -0.05 | -0.04 | 153.29 | 0.87 | 0.60 |
| MYL9FG | X | 154.41 | 6.25 | 4.92 | 158.87 | 6.45 | 4.45 |
| NDG3C9 | | 147.48 | -0.68 | -0.54 | 151.10 | -1.31 | -0.91 |
| NEQYT7 | | 146.84 | -1.32 | -1.04 | 151.66 | -0.76 | -0.52 |
| NEUGXW | | 148.00 | -0.16 | -0.12 | 152.30 | -0.12 | -0.08 |
| NPC426 | | 147.80 | -0.36 | -0.28 | 153.70 | 1.28 | 0.89 |
| NQ9JFN | | 148.71 | 0.55 | 0.43 | 154.08 | 1.66 | 1.15 |
| NXLM7M | | 146.20 | -1.96 | -1.54 | 149.60 | -2.82 | -1.94 |
| P672Q8 | | 148.23 | 0.07 | 0.06 | 152.97 | 0.56 | 0.38 |
| P93RQR | | 149.00 | 0.84 | 0.66 | 151.00 | -1.42 | -0.98 |
| PRG2Z6 | | 146.70 | -1.46 | -1.15 | 150.50 | -1.92 | -1.32 |
| PT8CNC | | 147.06 | -1.10 | -0.87 | 152.70 | 0.28 | 0.19 |
| Q3QBQ2 | | 148.00 | -0.16 | -0.12 | 152.00 | -0.42 | -0.29 |
| QELCD4 | | 148.10 | -0.05 | -0.04 | 153.89 | 1.48 | 1.02 |
| QM6DY9 | | 147.00 | -1.16 | -0.91 | 150.40 | -2.02 | -1.39 |
| QRWPTJ | | 148.00 | -0.16 | -0.12 | 153.00 | 0.58 | 0.40 |
| R2Z4AB | | 145.92 | -2.23 | -1.76 | 150.71 | -1.71 | -1.18 |
| R4M2H3 | | 147.60 | -0.56 | -0.44 | 153.20 | 0.78 | 0.54 |
| R6APU3 | | 148.35 | 0.19 | 0.15 | 151.27 | -1.14 | -0.79 |
| R6D8XT | | 147.90 | -0.26 | -0.20 | 153.30 | 0.88 | 0.61 |
| R82JXX | | 148.00 | -0.16 | -0.12 | 152.10 | -0.32 | -0.22 |
| R8F3HV | | 146.30 | -1.86 | -1.46 | 152.00 | -0.42 | -0.29 |
| RDBWGH | | 148.70 | 0.54 | 0.43 | 151.40 | -1.02 | -0.70 |
| RQTP44 | | 150.28 | 2.12 | 1.67 | 154.68 | 2.27 | 1.56 |
| RZKV83 | X | 142.18 | -5.98 | -4.71 | 147.93 | -4.49 | -3.09 |
| T6AWJ2 | | 149.49 | 1.33 | 1.05 | 152.96 | 0.55 | 0.38 |
| U9QJUJZ | | 148.70 | 0.54 | 0.43 | 153.80 | 1.38 | 0.95 |
| UAGPAQ | | 147.40 | -0.76 | -0.60 | 152.80 | 0.38 | 0.26 |
| UBD86Z | | 147.18 | -0.98 | -0.77 | 152.45 | 0.04 | 0.03 |
| UXRLB7 | | 146.60 | -1.56 | -1.23 | 151.10 | -1.32 | -0.91 |
| V2L3Z7 | | 149.19 | 1.03 | 0.81 | 152.92 | 0.50 | 0.35 |
| V2L4JH | | 147.30 | -0.86 | -0.67 | 149.10 | -3.32 | -2.29 |
| VM2NDX | | 148.52 | 0.36 | 0.29 | 153.60 | 1.18 | 0.81 |
| VU3W4Y | | 148.37 | 0.22 | 0.17 | 152.00 | -0.41 | -0.29 |
| VWVTQ8 | | 149.97 | 1.81 | 1.43 | 152.90 | 0.48 | 0.33 |
| VZT932 | | 150.45 | 2.29 | 1.80 | 151.83 | -0.59 | -0.41 |
| W4Q2LX | | 147.30 | -0.86 | -0.68 | 152.41 | 0.00 | 0.00 |
| W6WJKU | | 148.29 | 0.13 | 0.10 | 153.42 | 1.00 | 0.69 |
| WPNM8M | | 149.39 | 1.23 | 0.97 | 152.00 | -0.41 | -0.29 |
| WPNU8T | | 148.61 | 0.46 | 0.36 | 152.47 | 0.05 | 0.04 |
| WVCB2R | * | 151.60 | 3.44 | 2.71 | 153.40 | 0.98 | 0.68 |
| XP64ZU | * | 144.55 | -3.61 | -2.84 | 149.25 | -3.17 | -2.19 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1121

Tensile Strength: Lab-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| XV8D3F | X | 155.60 | 7.44 | 5.86 | 158.80 | 6.38 | 4.40 |
| YA6LLF | | 150.50 | 2.34 | 1.85 | 153.60 | 1.18 | 0.82 |
| YALX4L | | 147.80 | -0.36 | -0.28 | 152.60 | 0.18 | 0.13 |
| YFWRKC | | 148.89 | 0.74 | 0.58 | 150.05 | -2.36 | -1.63 |
| YG3GJE | | 150.12 | 1.97 | 1.55 | 152.16 | -0.25 | -0.17 |
| YXALUX | | 147.30 | -0.86 | -0.67 | 150.10 | -2.32 | -1.60 |
| Z98QFH | | 147.00 | -1.16 | -0.91 | 151.00 | -1.42 | -0.98 |
| ZGY9UR | | 147.30 | -0.86 | -0.67 | 153.00 | 0.58 | 0.40 |
| ZLGADD | | 151.00 | 2.84 | 2.24 | 155.30 | 2.88 | 1.99 |
| ZLVTZW | | 148.90 | 0.74 | 0.59 | 153.40 | 0.98 | 0.68 |
| ZPV4WW | | 147.79 | -0.36 | -0.28 | 153.16 | 0.75 | 0.51 |

Summary Statistics

| | Sample P69 | | Sample P70 | |
|--------------------------|------------|-----|------------|-----|
| Grand Means | 148.16 | ksi | 152.42 | ksi |
| Std Dev Btwn Labs | 1.27 | ksi | 1.45 | ksi |

Samples P69, P70 : AISI 4340 (E), AISI 4340 (F)

Statistics based on 93 of 105 reporting participants

Comments on Assigned Data Flags for Test #1121

- 2J6V3P (X) - Data for sample P69 are high and data for sample P70 are low.
- 39FPLC (X) - Data for sample P69 are high.
- 3TLX3V (X) - Data for sample P69 are high and data for sample P70 are low.
- 4434EQ (X) - Data for sample P70 are low.
- 83HLMF (X) - Data for sample P69 are low.
- CJMKXE (M) - Participant did not submit data for sample P69.
- EEQPWH (X) - Data for sample P69 are high.
- J8BMTC (X) - Data for sample P69 are high and data for sample P70 are low.
- LYWBYC (X) - Data for both samples are high.
- MYL9FG (X) - Data for both samples are high.
- RZKV83 (X) - Data for both samples are low.
- XV8D3F (X) - Data for both samples are high.



Analysis 1121

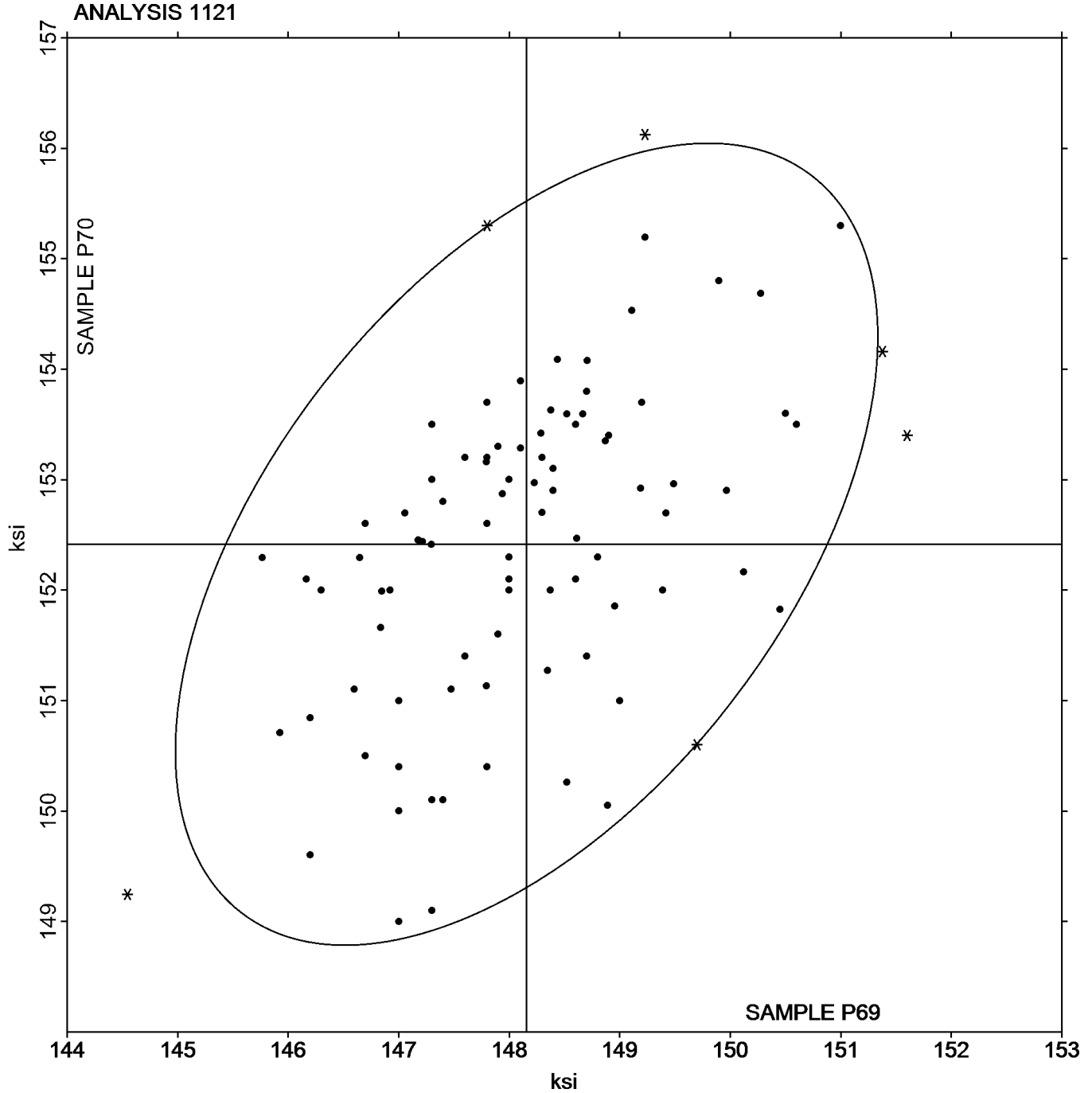
Tensile Strength: Lab-Machined Round Steel
ASTM E8

SAMPLE P69

148.16 ksi

SAMPLE P70

152.42 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1122

Yield Strength: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 27VDBL | * | 118.20 | -3.31 | -2.13 | 131.30 | 2.80 | 1.48 |
| 2GKXZT | | 122.20 | 0.69 | 0.45 | 127.40 | -1.10 | -0.58 |
| 2H9FTD | | 121.59 | 0.08 | 0.05 | 128.02 | -0.48 | -0.26 |
| 2J6V3P | X | 130.80 | 9.29 | 5.99 | 121.70 | -6.80 | -3.60 |
| 2KJ9VT | | 119.77 | -1.74 | -1.12 | 126.65 | -1.85 | -0.98 |
| 2NF49Z | | 119.66 | -1.85 | -1.19 | 127.78 | -0.72 | -0.38 |
| 39FPLC | X | 129.20 | 7.69 | 4.96 | 123.10 | -5.40 | -2.86 |
| 3L3WFR | | 119.84 | -1.66 | -1.07 | 129.55 | 1.05 | 0.55 |
| 3TLX3V | X | 130.06 | 8.55 | 5.51 | 120.18 | -8.32 | -4.41 |
| 4434EQ | | 121.70 | 0.19 | 0.12 | 129.90 | 1.40 | 0.74 |
| 4PJJUW | | 119.22 | -2.29 | -1.47 | 126.91 | -1.59 | -0.84 |
| 4R9PBM | | 122.41 | 0.90 | 0.58 | 131.41 | 2.90 | 1.54 |
| 4RRTNE | | 122.00 | 0.49 | 0.32 | 127.00 | -1.50 | -0.80 |
| 4XEJBA | | 121.69 | 0.18 | 0.12 | 125.60 | -2.90 | -1.53 |
| 6RLRKT | | 123.70 | 2.19 | 1.41 | 127.40 | -1.10 | -0.58 |
| 6TZ4EQ | | 121.80 | 0.29 | 0.19 | 126.00 | -2.50 | -1.32 |
| 6UA9RF | | 120.90 | -0.61 | -0.39 | 129.80 | 1.30 | 0.69 |
| 82M4LE | | 120.50 | -1.01 | -0.65 | 130.90 | 2.40 | 1.27 |
| 83HLMF | X | 115.00 | -6.51 | -4.19 | 128.00 | -0.50 | -0.27 |
| 8YWW6N | | 118.79 | -2.72 | -1.75 | 129.08 | 0.58 | 0.31 |
| 8ZRF8P | | 121.72 | 0.21 | 0.14 | 130.57 | 2.07 | 1.09 |
| 9FJHL9 | | 122.20 | 0.69 | 0.45 | 129.30 | 0.80 | 0.42 |
| 9WPWNN | * | 123.00 | 1.49 | 0.96 | 124.00 | -4.50 | -2.38 |
| A7RJ6M | | 123.90 | 2.39 | 1.54 | 128.40 | -0.10 | -0.05 |
| A8KC3R | | 121.11 | -0.40 | -0.26 | 130.54 | 2.03 | 1.08 |
| A9UGFF | | 122.80 | 1.29 | 0.83 | 130.00 | 1.50 | 0.79 |
| BFCA6K | | 122.20 | 0.69 | 0.45 | 130.50 | 2.00 | 1.06 |
| BMVF2Q | | 122.16 | 0.65 | 0.42 | 131.83 | 3.33 | 1.76 |
| BP4HXN | | 121.40 | -0.11 | -0.07 | 128.10 | -0.40 | -0.21 |
| BPXDE6 | | 119.10 | -2.41 | -1.55 | 127.90 | -0.60 | -0.32 |
| CJMKXE | | 123.21 | 1.70 | 1.10 | 129.69 | 1.19 | 0.63 |
| DJJEVB | | 121.63 | 0.12 | 0.08 | 132.46 | 3.96 | 2.10 |
| DKGRGH | | 122.21 | 0.70 | 0.45 | 130.40 | 1.90 | 1.00 |
| EEQPWH | X | 128.65 | 7.14 | 4.60 | 122.70 | -5.80 | -3.07 |
| EFHXWL | | 120.24 | -1.27 | -0.82 | 127.92 | -0.58 | -0.31 |
| EQWRAZ | | 123.46 | 1.95 | 1.26 | 128.16 | -0.35 | -0.18 |
| EXW8Y8 | | 121.83 | 0.32 | 0.21 | 128.07 | -0.43 | -0.23 |
| F862TZ | | 122.90 | 1.39 | 0.90 | 130.10 | 1.60 | 0.85 |
| F8KKDX | | 122.40 | 0.89 | 0.57 | 125.10 | -3.40 | -1.80 |
| FCCRW7 | | 121.74 | 0.23 | 0.15 | 131.02 | 2.52 | 1.33 |
| GMFXUE | | 121.20 | -0.31 | -0.20 | 127.40 | -1.10 | -0.58 |
| GV7QXY | | 121.30 | -0.21 | -0.13 | 127.40 | -1.10 | -0.58 |
| GXVWGA | * | 125.42 | 3.91 | 2.52 | 130.13 | 1.63 | 0.86 |
| J8BMTc | X | 128.70 | 7.19 | 4.63 | 120.00 | -8.50 | -4.50 |
| JXMQUW | | 122.30 | 0.79 | 0.51 | 129.70 | 1.20 | 0.63 |
| KAVPJH | | 120.00 | -1.51 | -0.97 | 126.00 | -2.50 | -1.32 |
| LYWBYC | X | 143.40 | 21.89 | 14.10 | 146.70 | 18.20 | 9.63 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1122

Yield Strength: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| M2CEW8 | | 120.35 | -1.16 | -0.75 | 128.79 | 0.29 | 0.15 |
| MLG3CA | | 120.20 | -1.31 | -0.84 | 127.50 | -1.00 | -0.53 |
| MN6JJW | | 121.50 | -0.01 | -0.01 | 129.20 | 0.70 | 0.37 |
| MVPJYA | | 121.25 | -0.26 | -0.16 | 126.76 | -1.74 | -0.92 |
| MWHDWE | | 121.57 | 0.06 | 0.04 | 129.02 | 0.52 | 0.27 |
| MYL9FG | X | 129.79 | 8.28 | 5.34 | 135.82 | 7.32 | 3.87 |
| NDG3C9 | | 120.28 | -1.23 | -0.79 | 126.20 | -2.30 | -1.22 |
| NEQYT7 | | 121.11 | -0.40 | -0.26 | 128.60 | 0.10 | 0.05 |
| NEUGXW | | 121.30 | -0.21 | -0.13 | 128.80 | 0.30 | 0.16 |
| NPC426 | | 119.70 | -1.81 | -1.17 | 128.50 | 0.00 | 0.00 |
| NQ9JFN | | 120.00 | -1.51 | -0.97 | 130.14 | 1.64 | 0.87 |
| NXLM7M | | 120.80 | -0.71 | -0.46 | 125.20 | -3.30 | -1.75 |
| P672Q8 | | 122.02 | 0.51 | 0.33 | 130.88 | 2.38 | 1.26 |
| P93RQR | | 123.00 | 1.49 | 0.96 | 127.00 | -1.50 | -0.80 |
| PRG2Z6 | | 120.00 | -1.51 | -0.97 | 126.10 | -2.40 | -1.27 |
| PT8CNC | | 119.87 | -1.63 | -1.05 | 128.75 | 0.25 | 0.13 |
| Q3QBQ2 | | 121.00 | -0.51 | -0.33 | 128.00 | -0.50 | -0.27 |
| QELCD4 | | 121.42 | -0.09 | -0.06 | 130.76 | 2.26 | 1.19 |
| QM6DY9 | | 120.00 | -1.51 | -0.97 | 125.60 | -2.90 | -1.54 |
| QRWPTJ | | 120.00 | -1.51 | -0.97 | 127.00 | -1.50 | -0.80 |
| R2Z4AB | | 120.02 | -1.49 | -0.96 | 127.81 | -0.69 | -0.37 |
| R4M2H3 | | 120.40 | -1.11 | -0.71 | 129.50 | 1.00 | 0.53 |
| R6APU3 | | 123.97 | 2.46 | 1.59 | 128.26 | -0.24 | -0.13 |
| R6D8XT | | 121.10 | -0.41 | -0.26 | 129.70 | 1.20 | 0.63 |
| R82JXX | | 122.20 | 0.69 | 0.45 | 128.60 | 0.10 | 0.05 |
| R8F3HV | | 119.20 | -2.31 | -1.49 | 129.40 | 0.90 | 0.48 |
| RDBWGH | | 121.00 | -0.51 | -0.33 | 123.80 | -4.70 | -2.49 |
| RQTP44 | | 123.11 | 1.60 | 1.03 | 131.61 | 3.10 | 1.64 |
| RZKV83 | X | 112.67 | -8.84 | -5.69 | 117.16 | -11.34 | -6.00 |
| T6AWJ2 | | 122.49 | 0.98 | 0.63 | 129.66 | 1.15 | 0.61 |
| U9QJUJZ | | 122.20 | 0.69 | 0.45 | 131.20 | 2.70 | 1.43 |
| UAGPAQ | | 120.80 | -0.71 | -0.46 | 129.10 | 0.60 | 0.32 |
| UBD86Z | | 120.38 | -1.13 | -0.73 | 129.06 | 0.56 | 0.29 |
| UXRLB7 | | 120.50 | -1.01 | -0.65 | 128.40 | -0.10 | -0.05 |
| V2L3Z7 | | 123.12 | 1.61 | 1.04 | 128.90 | 0.40 | 0.21 |
| V2L4JH | | 121.30 | -0.21 | -0.13 | 125.00 | -3.50 | -1.85 |
| VM2NDX | | 121.25 | -0.26 | -0.16 | 129.23 | 0.73 | 0.38 |
| VU3W4Y | | 121.25 | -0.26 | -0.16 | 127.20 | -1.30 | -0.69 |
| VWVTQ8 | | 121.82 | 0.31 | 0.20 | 128.25 | -0.26 | -0.14 |
| VZT932 | * | 126.30 | 4.79 | 3.09 | 128.94 | 0.44 | 0.23 |
| W6WJKU | | 122.01 | 0.51 | 0.33 | 131.29 | 2.79 | 1.48 |
| WPNM8M | | 123.57 | 2.06 | 1.33 | 127.20 | -1.30 | -0.69 |
| WPNU8T | | 122.38 | 0.87 | 0.56 | 130.05 | 1.55 | 0.82 |
| WVCB2R | * | 126.20 | 4.69 | 3.02 | 130.40 | 1.90 | 1.00 |
| XP64ZU | X | 64.40 | -57.11 | -36.80 | 62.58 | -65.92 | -34.89 |
| XV8D3F | X | 130.20 | 8.69 | 5.60 | 134.90 | 6.40 | 3.39 |
| YA6LLF | | 123.10 | 1.59 | 1.03 | 128.30 | -0.20 | -0.11 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1122

Yield Strength: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| YALX4L | | 121.00 | -0.51 | -0.33 | 129.10 | 0.60 | 0.32 |
| YFWRKC | | 123.12 | 1.61 | 1.03 | 126.61 | -1.89 | -1.00 |
| YG3GJE | | 123.15 | 1.64 | 1.06 | 127.51 | -1.00 | -0.53 |
| YXALUX | * | 120.60 | -0.91 | -0.59 | 123.40 | -5.10 | -2.70 |
| Z98QFH | | 121.00 | -0.51 | -0.33 | 127.00 | -1.50 | -0.80 |
| ZGY9UR | * | 117.40 | -4.11 | -2.65 | 126.60 | -1.90 | -1.01 |
| ZLGADD | | 123.30 | 1.79 | 1.15 | 129.96 | 1.46 | 0.77 |
| ZLVTZW | | 121.10 | -0.41 | -0.26 | 129.30 | 0.80 | 0.42 |
| ZPV4WW | | 119.69 | -1.82 | -1.17 | 129.69 | 1.19 | 0.63 |

Summary Statistics

| | Sample P69 | | Sample P70 | |
|--------------------------|------------|-----|------------|-----|
| Grand Means | 121.51 | ksi | 128.50 | ksi |
| Std Dev Btwn Labs | 1.55 | ksi | 1.89 | ksi |

Samples P69, P70 : AISI 4340 (E), AISI 4340 (F)

Statistics based on 92 of 103 reporting participants

Comments on Assigned Data Flags for Test #1122

- 2J6V3P (X) - Data for sample P69 are high and data for sample P70 are low.
- 39FPLC (X) - Data for sample P69 are high and data for sample P70 are low.
- 3TLX3V (X) - Data for sample P69 are high and data for sample P70 are low.
- 83HLMF (X) - Data for sample P69 are low.
- EEQPWH (X) - Data for sample P69 are high and data for sample P70 are low.
- J8BMTC (X) - Data for sample P69 are high and data for sample P70 are low.
- LYWBYC (X) - Data for both samples are high.
- MYL9FG (X) - Data for both samples are high.
- RZKV83 (X) - Data for both samples are low.
- XP64ZU (X) - Data for both samples are extremely low.
- XV8D3F (X) - Data for both samples are high.



Analysis 1122

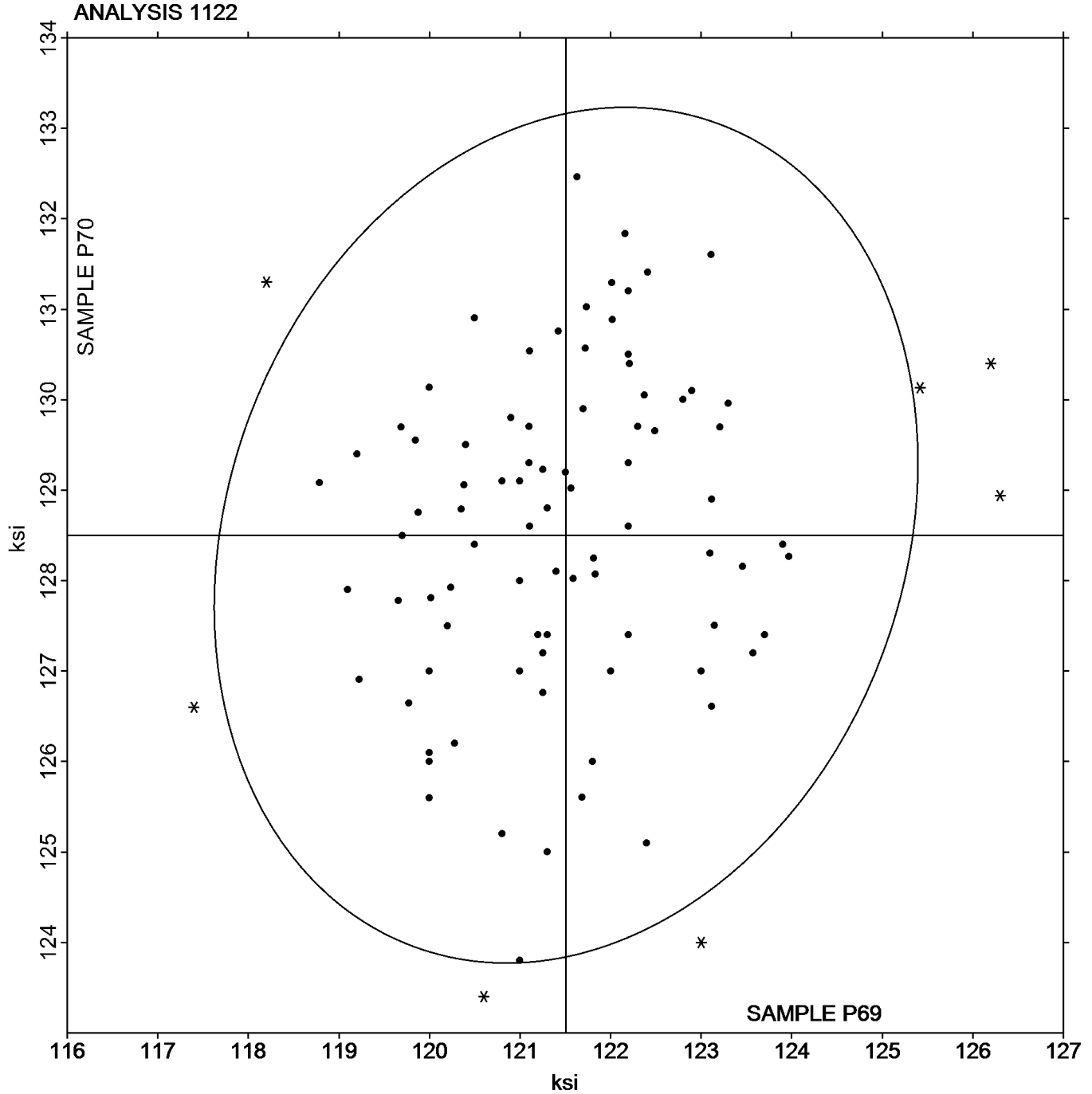
Yield Strength: Lab-Machined Round Steel
ASTM E8

SAMPLE P69

121.51 ksi

SAMPLE P70

128.50 ksi





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1123

Elongation: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 27VDBL | | 18.60 | 0.66 | 0.60 | 17.10 | -0.21 | -0.16 |
| 2GKXZT | | 17.80 | -0.14 | -0.13 | 17.40 | 0.09 | 0.07 |
| 2H9FTD | | 18.00 | 0.06 | 0.05 | 18.00 | 0.69 | 0.53 |
| 2J6V3P | | 17.60 | -0.34 | -0.31 | 17.30 | -0.01 | -0.01 |
| 2KJ9VT | | 17.00 | -0.94 | -0.87 | 15.00 | -2.31 | -1.76 |
| 2NF49Z | | 19.26 | 1.32 | 1.21 | 19.20 | 1.89 | 1.45 |
| 39FPLC | | 16.58 | -1.36 | -1.25 | 17.30 | -0.01 | -0.01 |
| 3L3WFR | X | 14.00 | -3.94 | -3.63 | 19.00 | 1.69 | 1.29 |
| 3TLX3V | | 19.40 | 1.46 | 1.34 | 18.20 | 0.89 | 0.68 |
| 4434EQ | | 17.50 | -0.44 | -0.41 | 17.50 | 0.19 | 0.15 |
| 4PJJUW | | 19.80 | 1.86 | 1.71 | 19.00 | 1.69 | 1.29 |
| 4R9PBM | | 17.50 | -0.44 | -0.41 | 19.30 | 1.99 | 1.52 |
| 4RRTNE | | 18.10 | 0.16 | 0.14 | 17.20 | -0.11 | -0.08 |
| 4XEJBA | | 18.00 | 0.06 | 0.05 | 15.50 | -1.81 | -1.38 |
| 6RLRKT | | 19.10 | 1.16 | 1.06 | 17.40 | 0.09 | 0.07 |
| 6TZ4EQ | | 18.10 | 0.16 | 0.14 | 18.80 | 1.49 | 1.14 |
| 6UA9RF | | 17.50 | -0.44 | -0.41 | 17.00 | -0.31 | -0.23 |
| 82M4LE | | 18.20 | 0.26 | 0.24 | 18.10 | 0.79 | 0.61 |
| 83HLMF | * | 21.00 | 3.06 | 2.81 | 19.00 | 1.69 | 1.29 |
| 8YWW6N | | 17.70 | -0.24 | -0.22 | 16.90 | -0.41 | -0.31 |
| 8ZRF8P | | 17.00 | -0.94 | -0.87 | 16.20 | -1.11 | -0.85 |
| 9FJHL9 | * | 18.15 | 0.21 | 0.19 | 14.80 | -2.51 | -1.92 |
| 9WPWNN | | 17.00 | -0.94 | -0.87 | 15.00 | -2.31 | -1.76 |
| A7RJ6M | | 17.00 | -0.94 | -0.87 | 16.50 | -0.81 | -0.62 |
| A8KC3R | | 16.00 | -1.94 | -1.79 | 15.40 | -1.91 | -1.46 |
| A9UGFF | | 18.70 | 0.76 | 0.70 | 19.00 | 1.69 | 1.29 |
| BFCA6K | | 17.60 | -0.34 | -0.31 | 18.80 | 1.49 | 1.14 |
| BMVF2Q | | 18.71 | 0.77 | 0.71 | 19.41 | 2.10 | 1.61 |
| BP4HXN | | 18.20 | 0.26 | 0.24 | 17.80 | 0.49 | 0.38 |
| BPXDE6 | | 18.10 | 0.16 | 0.14 | 16.50 | -0.81 | -0.62 |
| CJMKXE | M | No Data Reported | | | 17.62 | 0.31 | 0.24 |
| DJJEVB | | 18.90 | 0.96 | 0.88 | 18.35 | 1.04 | 0.80 |
| DKGRGH | * | 17.50 | -0.44 | -0.41 | 19.50 | 2.19 | 1.68 |
| EEQPWH | | 16.00 | -1.94 | -1.79 | 15.00 | -2.31 | -1.76 |
| EFHXWL | | 16.60 | -1.34 | -1.23 | 15.60 | -1.71 | -1.30 |
| EQWRAZ | | 18.80 | 0.86 | 0.79 | 18.20 | 0.89 | 0.68 |
| EXW8Y8 | | 20.00 | 2.06 | 1.89 | 20.00 | 2.69 | 2.06 |
| F862TZ | | 20.50 | 2.56 | 2.35 | 20.00 | 2.69 | 2.06 |
| F8KKDX | | 19.30 | 1.36 | 1.25 | 17.90 | 0.59 | 0.45 |
| FCCRW7 | | 18.00 | 0.06 | 0.05 | 17.00 | -0.31 | -0.23 |
| GMFXUE | | 16.50 | -1.44 | -1.33 | 15.50 | -1.81 | -1.38 |
| GV7QXY | | 17.10 | -0.84 | -0.77 | 15.50 | -1.81 | -1.38 |
| GXVWGA | | 18.50 | 0.56 | 0.51 | 19.00 | 1.69 | 1.29 |
| J8BMTc | | 17.00 | -0.94 | -0.87 | 18.00 | 0.69 | 0.53 |
| JXMQUW | | 18.70 | 0.76 | 0.70 | 16.00 | -1.31 | -1.00 |
| KAVPJH | | 17.50 | -0.44 | -0.41 | 17.50 | 0.19 | 0.15 |
| LYWBYC | X | 17.50 | -0.44 | -0.41 | 20.50 | 3.19 | 2.44 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1123

Elongation: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| M2CEW8 | | 19.00 | 1.06 | 0.97 | 17.60 | 0.29 | 0.22 |
| MLG3CA | | 15.60 | -2.34 | -2.15 | 14.90 | -2.41 | -1.84 |
| MN6JJW | | 17.00 | -0.94 | -0.87 | 17.00 | -0.31 | -0.23 |
| MVPJYA | | 19.00 | 1.06 | 0.97 | 20.00 | 2.69 | 2.06 |
| MWHDWE | | 19.08 | 1.14 | 1.05 | 18.50 | 1.19 | 0.91 |
| MYL9FG | | 16.90 | -1.04 | -0.96 | 16.80 | -0.51 | -0.39 |
| NDG3C9 | | 18.10 | 0.16 | 0.14 | 17.30 | -0.01 | -0.01 |
| NEQYT7 | | 18.06 | 0.12 | 0.11 | 17.60 | 0.29 | 0.22 |
| NEUGXW | | 17.00 | -0.94 | -0.87 | 17.00 | -0.31 | -0.23 |
| NPC426 | | 15.70 | -2.24 | -2.06 | 15.50 | -1.81 | -1.38 |
| NQ9JFN | | 18.80 | 0.86 | 0.79 | 17.35 | 0.04 | 0.03 |
| NXLM7M | | 17.40 | -0.54 | -0.50 | 18.10 | 0.79 | 0.61 |
| P672Q8 | | 17.30 | -0.64 | -0.59 | 17.40 | 0.09 | 0.07 |
| P93RQR | | 17.20 | -0.74 | -0.68 | 16.00 | -1.31 | -1.00 |
| PRG2Z6 | | 18.20 | 0.26 | 0.24 | 15.50 | -1.81 | -1.38 |
| PT8CNC | | 18.06 | 0.12 | 0.11 | 16.00 | -1.31 | -1.00 |
| Q3QBQ2 | | 17.50 | -0.44 | -0.41 | 17.70 | 0.39 | 0.30 |
| QELCD4 | | 16.00 | -1.94 | -1.79 | 15.00 | -2.31 | -1.76 |
| QM6DY9 | | 19.00 | 1.06 | 0.97 | 18.00 | 0.69 | 0.53 |
| QRWPTJ | | 18.00 | 0.06 | 0.05 | 17.00 | -0.31 | -0.23 |
| R2Z4AB | | 17.10 | -0.84 | -0.77 | 17.60 | 0.29 | 0.22 |
| R4M2H3 | | 17.60 | -0.34 | -0.31 | 16.60 | -0.71 | -0.54 |
| R6APU3 | | 20.60 | 2.66 | 2.44 | 19.40 | 2.09 | 1.60 |
| R6D8XT | | 17.50 | -0.44 | -0.41 | 17.50 | 0.19 | 0.15 |
| R82JXX | | 17.60 | -0.34 | -0.31 | 18.20 | 0.89 | 0.68 |
| R8F3HV | | 18.10 | 0.16 | 0.14 | 16.60 | -0.71 | -0.54 |
| RDBWGH | | 18.90 | 0.96 | 0.88 | 16.10 | -1.21 | -0.92 |
| RQTP44 | | 18.00 | 0.06 | 0.05 | 17.00 | -0.31 | -0.23 |
| RZKV83 | | 16.25 | -1.69 | -1.56 | 15.10 | -2.21 | -1.69 |
| T6AWJ2 | | 17.00 | -0.94 | -0.87 | 17.00 | -0.31 | -0.23 |
| U9QJUJZ | | 17.30 | -0.64 | -0.59 | 16.30 | -1.01 | -0.77 |
| UAGPAQ | | 17.50 | -0.44 | -0.41 | 17.00 | -0.31 | -0.23 |
| UBD86Z | | 16.00 | -1.94 | -1.79 | 17.00 | -0.31 | -0.23 |
| UXRLB7 | | 18.50 | 0.56 | 0.51 | 19.00 | 1.69 | 1.29 |
| V2L3Z7 | | 16.70 | -1.24 | -1.14 | 15.60 | -1.71 | -1.30 |
| V2L4JH | | 17.50 | -0.44 | -0.41 | 16.50 | -0.81 | -0.62 |
| VM2NDX | | 19.00 | 1.06 | 0.97 | 19.00 | 1.69 | 1.29 |
| VU3W4Y | | 17.48 | -0.46 | -0.43 | 16.80 | -0.51 | -0.39 |
| VWVTQ8 | | 17.60 | -0.34 | -0.31 | 16.80 | -0.51 | -0.39 |
| VZT932 | | 18.10 | 0.16 | 0.14 | 18.60 | 1.29 | 0.99 |
| W6WJKU | | 19.00 | 1.06 | 0.97 | 19.00 | 1.69 | 1.29 |
| WPNM8M | | 17.50 | -0.44 | -0.41 | 17.20 | -0.11 | -0.08 |
| WPNU8T | | 18.95 | 1.01 | 0.93 | 18.15 | 0.84 | 0.64 |
| WVCB2R | | 19.45 | 1.51 | 1.39 | 18.10 | 0.79 | 0.61 |
| XP64ZU | X | 17.20 | -0.74 | -0.68 | 12.90 | -4.41 | -3.37 |
| XV8D3F | X | 13.65 | -4.29 | -3.95 | 15.75 | -1.56 | -1.19 |
| YA6LLF | | 17.70 | -0.24 | -0.22 | 17.20 | -0.11 | -0.08 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1123

Elongation: Lab-Machined Round Steel
ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| YALX4L | | 17.50 | -0.44 | -0.41 | 17.00 | -0.31 | -0.23 |
| YFWRKC | | 19.10 | 1.16 | 1.06 | 16.80 | -0.51 | -0.39 |
| YG3GJE | | 19.67 | 1.73 | 1.59 | 19.04 | 1.73 | 1.32 |
| YXALUX | | 18.10 | 0.16 | 0.14 | 15.50 | -1.81 | -1.38 |
| Z98QFH | | 18.00 | 0.06 | 0.05 | 16.80 | -0.51 | -0.39 |
| ZGY9UR | | 17.20 | -0.74 | -0.68 | 16.50 | -0.81 | -0.62 |
| ZLGADD | | 16.55 | -1.39 | -1.28 | 17.35 | 0.04 | 0.03 |
| ZLVTZW | | 18.70 | 0.76 | 0.70 | 17.20 | -0.11 | -0.08 |
| ZPV4WW | | 19.60 | 1.66 | 1.52 | 18.60 | 1.29 | 0.99 |

Summary Statistics

| | Sample P69 | | Sample P70 | |
|----------------------------|------------|---------|------------|---------|
| Grand Means | 17.94 | Percent | 17.31 | Percent |
| Stnd Dev Btrwn Labs | 1.09 | Percent | 1.31 | Percent |

Samples P69, P70 : AISI 4340 (E), AISI 4340 (F)

Statistics based on 98 of 103 reporting participants

Comments on Assigned Data Flags for Test #1123

- 3L3WFR (X) - Data for sample P69 are low.
- CJMKXE (M) - Participant did not submit data for sample .
- LYWBYC (X) - Inconsistent in testing between samples.
- XP64ZU (X) - Data for sample P70 are low.
- XV8D3F (X) - Data for sample P69 are low.



Analysis 1123

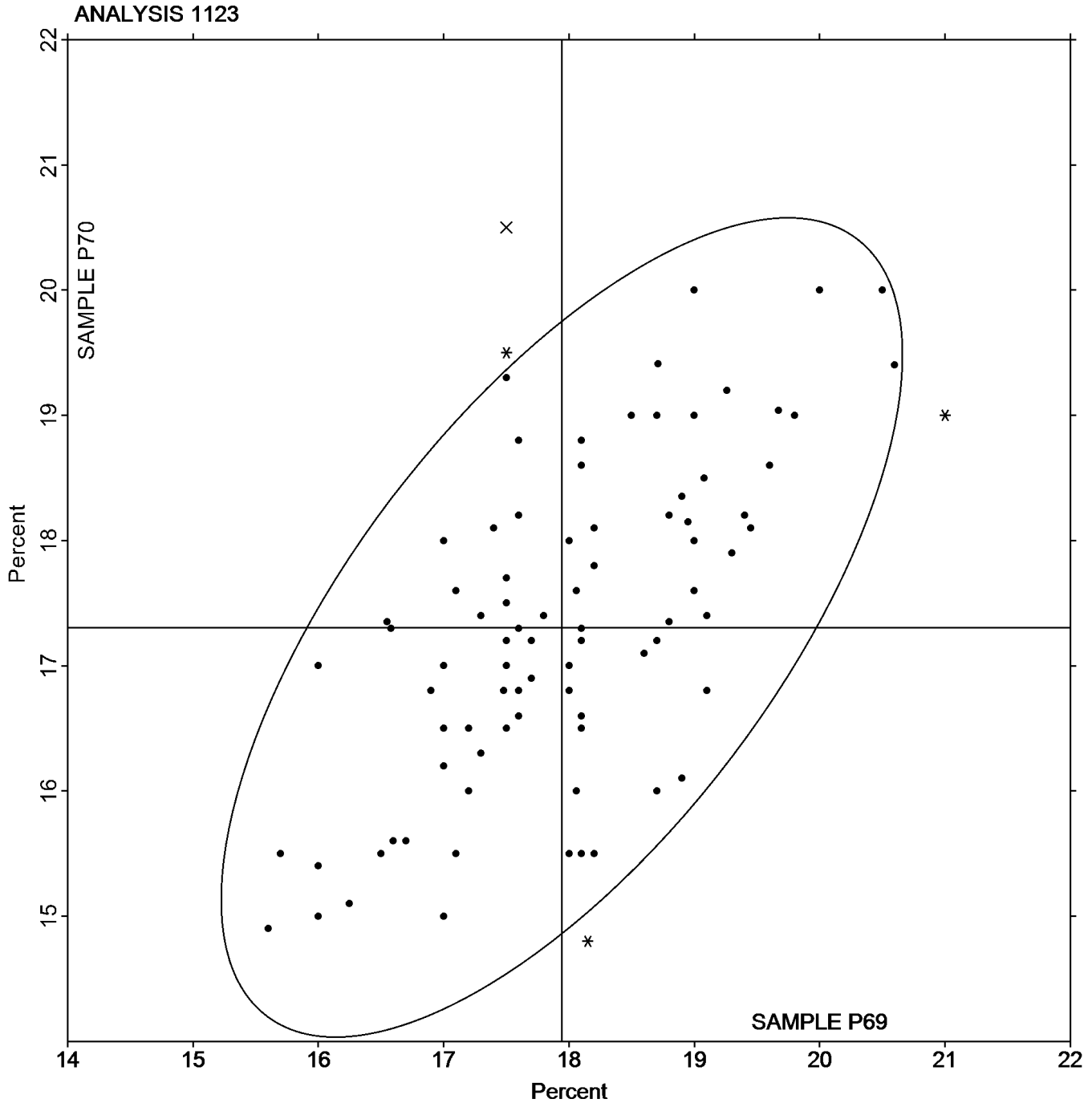
Elongation: Lab-Machined Round Steel
ASTM E8

SAMPLE P69

17.94 Percent

SAMPLE P70

17.31 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1124

Reduction of Area: Lab-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2GKXZT | | 54.00 | -1.47 | -1.03 | 48.20 | -5.39 | -1.67 |
| 2H9FTD | | 54.50 | -0.97 | -0.68 | 55.60 | 2.01 | 0.62 |
| 2J6V3P | | 56.30 | 0.83 | 0.58 | 57.00 | 3.41 | 1.06 |
| 2KJ9VT | | 56.60 | 1.13 | 0.79 | 47.30 | -6.29 | -1.95 |
| 2NF49Z | | 56.09 | 0.62 | 0.43 | 57.42 | 3.83 | 1.19 |
| 39FPLC | | 53.10 | -2.37 | -1.66 | 56.00 | 2.41 | 0.75 |
| 3L3WFR | | 55.00 | -0.47 | -0.33 | 53.00 | -0.59 | -0.18 |
| 3TLX3V | | 58.50 | 3.03 | 2.11 | 54.20 | 0.61 | 0.19 |
| 4434EQ | | 53.30 | -2.17 | -1.52 | 56.90 | 3.31 | 1.03 |
| 4PJJUW | | 57.50 | 2.03 | 1.42 | 53.00 | -0.59 | -0.18 |
| 4R9PBM | X | 49.20 | -6.27 | -4.38 | 56.30 | 2.71 | 0.84 |
| 4RRTNE | | 56.70 | 1.23 | 0.86 | 48.50 | -5.09 | -1.57 |
| 4XEJBA | | 56.00 | 0.53 | 0.37 | 50.00 | -3.59 | -1.11 |
| 6RLRKT | | 55.90 | 0.43 | 0.30 | 46.30 | -7.29 | -2.26 |
| 6UA9RF | | 56.20 | 0.73 | 0.51 | 54.10 | 0.51 | 0.16 |
| 82M4LE | * | 58.50 | 3.03 | 2.11 | 59.50 | 5.91 | 1.83 |
| 83HLMF | | 58.00 | 2.53 | 1.76 | 51.00 | -2.59 | -0.80 |
| 8YVW6N | | 56.00 | 0.53 | 0.37 | 53.90 | 0.31 | 0.10 |
| 8ZRF8P | | 57.00 | 1.53 | 1.07 | 54.80 | 1.21 | 0.38 |
| 9FJHL9 | | 55.82 | 0.35 | 0.24 | 47.37 | -6.22 | -1.92 |
| 9WPWNN | | 56.00 | 0.53 | 0.37 | 51.00 | -2.59 | -0.80 |
| A7RJ6M | | 56.30 | 0.83 | 0.58 | 55.20 | 1.61 | 0.50 |
| A8KC3R | | 55.30 | -0.17 | -0.12 | 52.20 | -1.39 | -0.43 |
| A9UGFF | | 56.50 | 1.03 | 0.72 | 56.70 | 3.11 | 0.96 |
| BFCA6K | X | 46.00 | -9.47 | -6.62 | 49.50 | -4.09 | -1.27 |
| BMVF2Q | | 55.19 | -0.28 | -0.20 | 57.81 | 4.22 | 1.31 |
| BP4HXN | | 57.40 | 1.93 | 1.35 | 53.90 | 0.31 | 0.10 |
| BPXDE6 | | 57.00 | 1.53 | 1.07 | 50.60 | -2.99 | -0.92 |
| CJMKXE | M | No Data Reported | | | 42.40 | -11.19 | -3.46 |
| DJJEVB | | 56.70 | 1.23 | 0.86 | 59.04 | 5.45 | 1.69 |
| DKGRGH | * | 52.20 | -3.27 | -2.29 | 57.15 | 3.56 | 1.10 |
| EEQPWH | X | 49.00 | -6.47 | -4.52 | 54.00 | 0.41 | 0.13 |
| EFHXWL | | 56.80 | 1.33 | 0.93 | 52.40 | -1.19 | -0.37 |
| EXW8Y8 | | 55.00 | -0.47 | -0.33 | 56.00 | 2.41 | 0.75 |
| F862TZ | | 56.20 | 0.73 | 0.51 | 54.60 | 1.01 | 0.31 |
| F8KKDX | | 56.80 | 1.33 | 0.93 | 50.20 | -3.39 | -1.05 |
| FCCRW7 | | 56.00 | 0.53 | 0.37 | 53.00 | -0.59 | -0.18 |
| GMFXUE | | 55.10 | -0.37 | -0.26 | 47.60 | -5.99 | -1.85 |
| GV7QXY | | 54.80 | -0.67 | -0.47 | 48.10 | -5.49 | -1.70 |
| GXVWGA | | 56.00 | 0.53 | 0.37 | 57.00 | 3.41 | 1.06 |
| J8BMTc | | 53.40 | -2.07 | -1.45 | 56.40 | 2.81 | 0.87 |
| JXMQUW | | 56.50 | 1.03 | 0.72 | 46.80 | -6.79 | -2.10 |
| KAVPJH | * | 52.40 | -3.07 | -2.15 | 47.20 | -6.39 | -1.98 |
| LYWBYC | | 54.00 | -1.47 | -1.03 | 55.00 | 1.41 | 0.44 |
| M2CEW8 | | 53.00 | -2.47 | -1.73 | 53.00 | -0.59 | -0.18 |
| MLG3CA | X | 52.70 | -2.77 | -1.94 | 44.60 | -8.99 | -2.78 |
| MN6JJW | | 55.20 | -0.27 | -0.19 | 54.90 | 1.31 | 0.41 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1124

Reduction of Area: Lab-Machined Round Steel ASTM E8

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| MVPJYA | | 56.00 | 0.53 | 0.37 | 55.00 | 1.41 | 0.44 |
| MWHDWE | | 53.49 | -1.98 | -1.38 | 52.26 | -1.33 | -0.41 |
| MYL9FG | | 55.47 | 0.00 | 0.00 | 54.85 | 1.26 | 0.39 |
| NDG3C9 | | 54.20 | -1.27 | -0.89 | 51.40 | -2.19 | -0.68 |
| NEQYT7 | | 53.64 | -1.83 | -1.28 | 54.87 | 1.28 | 0.40 |
| NEUGXW | | 55.50 | 0.03 | 0.02 | 54.90 | 1.31 | 0.41 |
| NPC426 | | 55.30 | -0.17 | -0.12 | 52.20 | -1.39 | -0.43 |
| NQ9JFN | | 55.29 | -0.18 | -0.13 | 54.38 | 0.79 | 0.25 |
| NXLM7M | | 56.00 | 0.53 | 0.37 | 53.60 | 0.01 | 0.00 |
| P672Q8 | | 55.00 | -0.47 | -0.33 | 55.60 | 2.01 | 0.62 |
| P93RQR | | 56.30 | 0.83 | 0.58 | 51.30 | -2.29 | -0.71 |
| PRG2Z6 | | 54.90 | -0.57 | -0.40 | 49.20 | -4.39 | -1.36 |
| PT8CNC | | 55.73 | 0.26 | 0.18 | 54.84 | 1.25 | 0.39 |
| Q3QBQ2 | | 53.50 | -1.97 | -1.38 | 55.50 | 1.91 | 0.59 |
| QELCD4 | | 57.00 | 1.53 | 1.07 | 54.00 | 0.41 | 0.13 |
| QM6DY9 | | 55.80 | 0.33 | 0.23 | 51.30 | -2.29 | -0.71 |
| QRWPTJ | | 56.00 | 0.53 | 0.37 | 52.00 | -1.59 | -0.49 |
| R2Z4AB | * | 51.50 | -3.97 | -2.77 | 54.20 | 0.61 | 0.19 |
| R4M2H3 | | 57.30 | 1.83 | 1.28 | 53.00 | -0.59 | -0.18 |
| R6APU3 | | 54.84 | -0.63 | -0.44 | 58.34 | 4.75 | 1.47 |
| R6D8XT | | 56.40 | 0.93 | 0.65 | 56.30 | 2.71 | 0.84 |
| R82JXX | | 55.80 | 0.33 | 0.23 | 58.20 | 4.61 | 1.43 |
| R8F3HV | | 56.70 | 1.23 | 0.86 | 52.90 | -0.69 | -0.21 |
| RDBWGH | | 55.20 | -0.27 | -0.19 | 50.70 | -2.89 | -0.89 |
| RQTP44 | | 54.00 | -1.47 | -1.03 | 57.00 | 3.41 | 1.06 |
| RZKV83 | | 54.40 | -1.07 | -0.75 | 49.46 | -4.13 | -1.28 |
| T6AWJ2 | | 57.00 | 1.53 | 1.07 | 57.00 | 3.41 | 1.06 |
| U9QJUJZ | | 56.40 | 0.93 | 0.65 | 53.30 | -0.29 | -0.09 |
| UAGPAQ | | 55.60 | 0.13 | 0.09 | 54.90 | 1.31 | 0.41 |
| UBD86Z | | 54.00 | -1.47 | -1.03 | 58.00 | 4.41 | 1.37 |
| UXRLB7 | | 56.30 | 0.83 | 0.58 | 57.20 | 3.61 | 1.12 |
| V2L3Z7 | | 56.50 | 1.03 | 0.72 | 53.00 | -0.59 | -0.18 |
| V2L4JH | | 56.90 | 1.43 | 1.00 | 49.70 | -3.89 | -1.20 |
| VM2NDX | | 55.00 | -0.47 | -0.33 | 58.00 | 4.41 | 1.37 |
| VU3W4Y | | 55.49 | 0.02 | 0.01 | 49.02 | -4.57 | -1.41 |
| VWVTQ8 | | 54.50 | -0.97 | -0.68 | 52.10 | -1.49 | -0.46 |
| VZT932 | | 56.90 | 1.43 | 1.00 | 57.10 | 3.51 | 1.09 |
| W6WJKU | | 58.00 | 2.53 | 1.76 | 59.00 | 5.41 | 1.68 |
| WPNM8M | | 52.70 | -2.77 | -1.94 | 51.60 | -1.99 | -0.61 |
| WPNU8T | | 55.20 | -0.27 | -0.19 | 56.18 | 2.59 | 0.80 |
| WVCB2R | | 56.00 | 0.53 | 0.37 | 51.00 | -2.59 | -0.80 |
| XP64ZU | X | 32.30 | -23.17 | -16.18 | 33.00 | -20.59 | -6.37 |
| XV8D3F | X | 50.90 | -4.57 | -3.19 | 57.70 | 4.11 | 1.27 |
| YA6LLF | | 53.40 | -2.07 | -1.45 | 55.80 | 2.21 | 0.69 |
| YALX4L | | 55.70 | 0.23 | 0.16 | 55.50 | 1.91 | 0.59 |
| YFWRKC | | 55.00 | -0.47 | -0.33 | 51.40 | -2.19 | -0.68 |
| YG3GJE | | 55.11 | -0.36 | -0.25 | 57.04 | 3.45 | 1.07 |



**Fasteners and Metals Interlaboratory Testing Program
Analysis 1124**

**Cycle 131
3rd Qtr 2020**

**Reduction of Area: Lab-Machined Round Steel
ASTM E8**

| WebCode | Data Flag | Sample P69 | | | Sample P70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| YXALUX | | 55.80 | 0.33 | 0.23 | 48.30 | -5.29 | -1.64 |
| Z98QFH | | 54.50 | -0.97 | -0.68 | 51.30 | -2.29 | -0.71 |
| ZGY9UR | | 53.00 | -2.47 | -1.73 | 57.00 | 3.41 | 1.06 |
| ZLGADD | | 53.21 | -2.26 | -1.58 | 54.14 | 0.55 | 0.17 |
| ZLVTZW | | 57.20 | 1.73 | 1.21 | 54.60 | 1.01 | 0.31 |
| ZPV4WW | | 55.50 | 0.03 | 0.02 | 54.10 | 0.51 | 0.16 |

Summary Statistics

| | Sample P69 | | Sample P70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 55.47 | Percent | 53.59 | Percent |
| Stnd Dev Btwn Labs | 1.43 | Percent | 3.23 | Percent |

Samples P69, P70 : AISI 4340 (E), AISI 4340 (F)

Statistics based on 93 of 100 reporting participants

Comments on Assigned Data Flags for Test #1124

- 4R9PBM (X) - Data for sample P69 are low.
- BFCA6K (X) - Data for sample P69 are low.
- CJMKXE (M) - Participant did not submit data for sample .
- EEQPWH (X) - Data for sample P69 are low.
- MLG3CA (X) - Data for sample P70 are low.
- XP64ZU (X) - Data for both samples are low.
- XV8D3F (X) - Data for sample P69 are low.



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1124

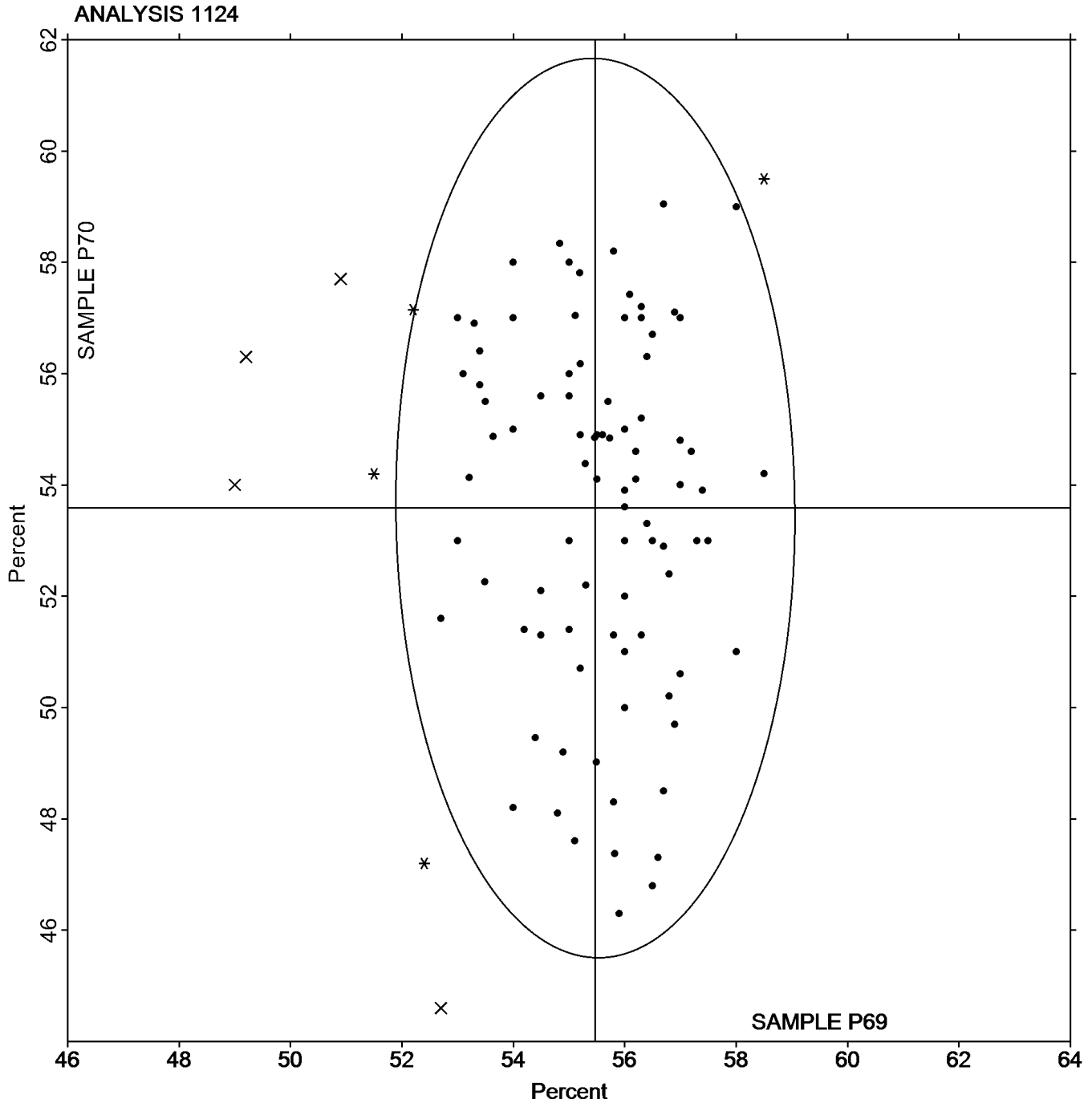
Reduction of Area: Lab-Machined Round Steel
ASTM E8

SAMPLE P69

55.47 Percent

SAMPLE P70

53.59 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1301

Rockwell Hardness: C & B Scales
ASTM E18

| WebCode | Data Flag | Sample N69 | | | Sample N70 | | |
|---------|-----------|------------|-----------------------|---------|------------|-----------------------|---------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 29N89Q | * | 93.42 | -0.37 | -0.91 | 93.34 | -0.93 | -2.23 |
| 2KJ9VT | | 93.80 | 0.01 | 0.03 | 94.20 | -0.07 | -0.17 |
| 2RG94T | | 93.41 | -0.38 | -0.93 | 93.97 | -0.31 | -0.73 |
| 2RVJXR | | 94.16 | 0.37 | 0.92 | 94.36 | 0.09 | 0.21 |
| 33UMQT | | 94.34 | 0.55 | 1.37 | 94.54 | 0.27 | 0.64 |
| 3FECCB | | 94.30 | 0.51 | 1.27 | 94.86 | 0.59 | 1.41 |
| 3L3WFR | | 93.88 | 0.09 | 0.23 | 94.28 | 0.01 | 0.02 |
| 3W8X4X | X | 14.54 | -79.25 | -196.72 | 15.00 | -79.27 | -189.59 |
| 3Z3VAF | X | 94.78 | 0.99 | 2.46 | 95.84 | 1.57 | 3.75 |
| 46C9RE | | 93.62 | -0.17 | -0.42 | 93.86 | -0.41 | -0.99 |
| 4D3WGP | | 93.24 | -0.55 | -1.36 | 93.64 | -0.63 | -1.51 |
| 4PZRKC | | 93.66 | -0.13 | -0.32 | 93.92 | -0.35 | -0.84 |
| 4YNLYU | | 93.92 | 0.13 | 0.33 | 94.52 | 0.25 | 0.59 |
| 627CFP | | 94.31 | 0.52 | 1.28 | 94.62 | 0.35 | 0.84 |
| 629VJF | X | 92.10 | -1.68 | -4.18 | 92.03 | -2.24 | -5.37 |
| 6T2ZPM | | 93.72 | -0.07 | -0.17 | 93.92 | -0.35 | -0.84 |
| 7K3V86 | | 93.58 | -0.21 | -0.52 | 94.14 | -0.13 | -0.32 |
| 82M4LE | | 93.86 | 0.07 | 0.18 | 94.24 | -0.03 | -0.08 |
| 83HLMF | | 93.30 | -0.49 | -1.21 | 93.50 | -0.77 | -1.85 |
| 8E9FYA | | 93.64 | -0.15 | -0.37 | 94.08 | -0.19 | -0.46 |
| 93BRKL | | 93.36 | -0.43 | -1.06 | 94.24 | -0.03 | -0.08 |
| 98PAZH | | 93.96 | 0.17 | 0.43 | 94.52 | 0.25 | 0.59 |
| 9E6BX7 | | 94.00 | 0.21 | 0.53 | 94.54 | 0.27 | 0.64 |
| 9JKHL6 | | 93.96 | 0.17 | 0.43 | 94.26 | -0.01 | -0.03 |
| 9NU2FR | | 93.52 | -0.27 | -0.67 | 94.18 | -0.09 | -0.22 |
| 9X49K8 | | 94.10 | 0.31 | 0.77 | 94.44 | 0.17 | 0.40 |
| AKMZW7 | | 93.74 | -0.05 | -0.12 | 94.50 | 0.23 | 0.54 |
| AKPP24 | | 93.64 | -0.15 | -0.37 | 93.80 | -0.47 | -1.13 |
| AUF8YK | | 93.40 | -0.39 | -0.96 | 93.64 | -0.63 | -1.51 |
| BED8FF | X | 92.76 | -1.03 | -2.55 | 93.88 | -0.39 | -0.94 |
| BK4GMT | | 94.03 | 0.24 | 0.60 | 94.84 | 0.56 | 1.35 |
| BK66DJ | | 93.42 | -0.37 | -0.91 | 93.82 | -0.45 | -1.08 |
| BK8YRJ | | 94.00 | 0.21 | 0.53 | 94.60 | 0.33 | 0.78 |
| BLF7YH | | 93.34 | -0.45 | -1.11 | 93.88 | -0.39 | -0.94 |
| BP4HXN | | 93.78 | -0.01 | -0.02 | 94.28 | 0.01 | 0.02 |
| C74WQ2 | | 93.52 | -0.27 | -0.67 | 93.90 | -0.37 | -0.89 |
| CF93HH | | 93.52 | -0.27 | -0.67 | 94.16 | -0.11 | -0.27 |
| CNK42X | X | 91.84 | -1.95 | -4.84 | 91.96 | -2.31 | -5.53 |
| CTVAJP | | 93.74 | -0.05 | -0.12 | 94.44 | 0.17 | 0.40 |
| CU8QW4 | | 93.61 | -0.18 | -0.44 | 94.35 | 0.08 | 0.20 |
| D482FX | | 94.46 | 0.67 | 1.67 | 94.80 | 0.53 | 1.26 |
| D8QVG6 | | 94.00 | 0.21 | 0.53 | 95.00 | 0.73 | 1.74 |
| DGHB7A | X | 95.44 | 1.65 | 4.10 | 95.96 | 1.69 | 4.04 |
| DKGRGH | | 94.08 | 0.29 | 0.72 | 94.62 | 0.35 | 0.83 |
| DQN9XJ | | 94.34 | 0.55 | 1.37 | 94.74 | 0.47 | 1.12 |
| EEQPWH | | 93.84 | 0.05 | 0.12 | 94.39 | 0.12 | 0.28 |
| EFHXWL | | 94.00 | 0.21 | 0.52 | 94.72 | 0.45 | 1.08 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1301

Rockwell Hardness: C & B Scales
ASTM E18

| WebCode | Data Flag | Sample N69 | | | Sample N70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| EJG6GJ | * | 93.86 | 0.07 | 0.18 | 94.98 | 0.71 | 1.69 |
| EJH4EX | | 93.82 | 0.03 | 0.08 | 94.44 | 0.17 | 0.40 |
| F6GPUU | | 93.46 | -0.33 | -0.82 | 94.04 | -0.23 | -0.56 |
| F8JJUK | | 93.74 | -0.05 | -0.12 | 94.42 | 0.15 | 0.35 |
| F8KKDX | | 93.82 | 0.03 | 0.08 | 94.36 | 0.09 | 0.21 |
| FCCRW7 | | 94.02 | 0.23 | 0.57 | 94.26 | -0.01 | -0.03 |
| FD8BX8 | | 93.52 | -0.27 | -0.67 | 93.86 | -0.41 | -0.99 |
| G36CPX | | 93.36 | -0.43 | -1.06 | 93.86 | -0.41 | -0.99 |
| GMFXUE | | 93.18 | -0.61 | -1.51 | 93.76 | -0.51 | -1.22 |
| GRLXMV | | 93.08 | -0.71 | -1.76 | 93.48 | -0.79 | -1.89 |
| H4U36B | | 94.36 | 0.57 | 1.42 | 94.82 | 0.55 | 1.31 |
| H7YQN8 | | 93.98 | 0.19 | 0.48 | 94.26 | -0.01 | -0.03 |
| HBFPNG | | 94.58 | 0.79 | 1.96 | 94.76 | 0.49 | 1.17 |
| HJ86DK | | 93.86 | 0.07 | 0.18 | 94.36 | 0.09 | 0.21 |
| HWUJ98 | | 94.00 | 0.21 | 0.53 | 94.38 | 0.11 | 0.26 |
| J2K99C | | 93.94 | 0.15 | 0.38 | 94.36 | 0.09 | 0.21 |
| J3FQAD | | 93.74 | -0.05 | -0.12 | 93.92 | -0.35 | -0.84 |
| J7YTDC | | 93.38 | -0.41 | -1.01 | 93.56 | -0.71 | -1.70 |
| JC4QHA | | 94.40 | 0.61 | 1.52 | 94.90 | 0.63 | 1.50 |
| JTTWUA | | 94.70 | 0.91 | 2.26 | 95.26 | 0.99 | 2.36 |
| JVFECV | | 92.80 | -0.99 | -2.45 | 93.40 | -0.87 | -2.09 |
| JWUWDF | | 93.40 | -0.39 | -0.96 | 94.00 | -0.27 | -0.65 |
| JXMQUW | | 94.34 | 0.55 | 1.37 | 94.64 | 0.37 | 0.88 |
| JZ8J4D | | 93.66 | -0.13 | -0.32 | 94.56 | 0.29 | 0.69 |
| KJMALA | | 93.68 | -0.11 | -0.27 | 94.06 | -0.21 | -0.51 |
| KMWRFW | | 93.78 | -0.01 | -0.02 | 94.44 | 0.17 | 0.40 |
| KRDXC7 | | 94.50 | 0.71 | 1.77 | 94.88 | 0.61 | 1.45 |
| KUMXGD | | 93.72 | -0.07 | -0.17 | 93.94 | -0.33 | -0.79 |
| L2FTRG | | 93.30 | -0.49 | -1.21 | 93.84 | -0.43 | -1.03 |
| LVBV6A | | 93.78 | -0.01 | -0.02 | 94.20 | -0.07 | -0.17 |
| M2CEW8 | | 93.38 | -0.41 | -1.01 | 94.18 | -0.09 | -0.22 |
| MYL9FG | | 94.52 | 0.73 | 1.82 | 95.12 | 0.85 | 2.03 |
| NEBXTP | | 94.04 | 0.25 | 0.62 | 94.22 | -0.05 | -0.12 |
| NEQYT7 | | 94.06 | 0.27 | 0.67 | 94.46 | 0.19 | 0.45 |
| NEW9PC | | 93.30 | -0.49 | -1.21 | 93.86 | -0.41 | -0.99 |
| NPVXR8 | | 93.82 | 0.03 | 0.08 | 93.94 | -0.33 | -0.79 |
| NU9MAV | | 93.54 | -0.25 | -0.62 | 94.04 | -0.23 | -0.56 |
| P93RQR | | 93.30 | -0.49 | -1.21 | 93.94 | -0.33 | -0.79 |
| PVZ7N3 | | 93.96 | 0.17 | 0.43 | 94.26 | -0.01 | -0.03 |
| Q3QBQ2 | * | 93.12 | -0.67 | -1.66 | 94.18 | -0.09 | -0.22 |
| Q7EFRL | | 93.52 | -0.27 | -0.67 | 94.22 | -0.05 | -0.12 |
| QAETB6 | | 93.24 | -0.55 | -1.36 | 93.86 | -0.41 | -0.99 |
| QCHJJ6 | | 93.82 | 0.03 | 0.08 | 94.24 | -0.03 | -0.08 |
| QM6DY9 | | 93.98 | 0.19 | 0.48 | 94.12 | -0.15 | -0.36 |
| QRWPTJ | | 93.30 | -0.49 | -1.21 | 94.10 | -0.17 | -0.41 |
| QT3ET8 | | 94.28 | 0.49 | 1.22 | 94.30 | 0.03 | 0.07 |
| R6APU3 | | 93.20 | -0.59 | -1.46 | 93.94 | -0.33 | -0.79 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1301

Rockwell Hardness: C & B Scales
ASTM E18

| WebCode | Data Flag | Sample N69 | | | Sample N70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| RHZET9 | | 93.54 | -0.25 | -0.62 | 94.06 | -0.21 | -0.51 |
| RUF962 | | 94.20 | 0.41 | 1.02 | 94.40 | 0.13 | 0.31 |
| RZKV83 | * | 94.86 | 1.07 | 2.66 | 95.00 | 0.73 | 1.74 |
| T3693Q | | 93.98 | 0.19 | 0.48 | 94.54 | 0.27 | 0.64 |
| T7QXM3 | | 94.28 | 0.49 | 1.22 | 94.82 | 0.55 | 1.31 |
| T8Z3ZR | * | 94.16 | 0.37 | 0.92 | 95.16 | 0.89 | 2.12 |
| TTKV8Z | | 94.06 | 0.27 | 0.67 | 94.46 | 0.19 | 0.45 |
| V2L3Z7 | | 93.34 | -0.45 | -1.11 | 94.32 | 0.05 | 0.11 |
| V2L4JH | | 93.84 | 0.05 | 0.13 | 94.20 | -0.07 | -0.17 |
| V4BFHN | * | 94.38 | 0.59 | 1.47 | 95.30 | 1.03 | 2.46 |
| VKXX6X | | 93.72 | -0.07 | -0.17 | 94.28 | 0.01 | 0.02 |
| VWVTQ8 | | 94.24 | 0.45 | 1.12 | 94.64 | 0.37 | 0.88 |
| W48D44 | | 93.31 | -0.48 | -1.19 | 94.29 | 0.02 | 0.05 |
| W4Q2LX | | 94.46 | 0.67 | 1.67 | 94.62 | 0.35 | 0.83 |
| WJKL9D | | 93.92 | 0.13 | 0.33 | 94.54 | 0.27 | 0.64 |
| WKWJDH | | 94.16 | 0.37 | 0.92 | 94.43 | 0.16 | 0.38 |
| WNVRQ6 | | 93.80 | 0.01 | 0.03 | 94.42 | 0.15 | 0.35 |
| WPNU8T | | 94.20 | 0.41 | 1.02 | 94.85 | 0.58 | 1.38 |
| WXZM2X | | 93.56 | -0.23 | -0.57 | 93.94 | -0.33 | -0.79 |
| XKBXPY | X | 91.80 | -1.99 | -4.94 | 93.68 | -0.59 | -1.42 |
| XMCAZ6 | | 93.50 | -0.29 | -0.72 | 94.20 | -0.07 | -0.17 |
| YAK3HU | | 93.36 | -0.43 | -1.06 | 93.88 | -0.39 | -0.94 |
| YXALUX | * | 93.14 | -0.65 | -1.61 | 93.22 | -1.05 | -2.52 |
| ZC78RC | | 93.56 | -0.23 | -0.57 | 93.96 | -0.31 | -0.75 |
| ZGY9UR | X | 92.42 | -1.37 | -3.40 | 93.32 | -0.95 | -2.28 |
| ZLVTZW | | 93.04 | -0.75 | -1.86 | 93.42 | -0.85 | -2.04 |
| ZNMREU | | 93.50 | -0.29 | -0.72 | 94.22 | -0.05 | -0.12 |
| ZTVFPB | | 94.12 | 0.33 | 0.82 | 94.22 | -0.05 | -0.12 |

Summary Statistics

| | Sample N69 | | Sample N70 | |
|--------------------------|------------|-----|------------|-----|
| Grand Means | 93.79 | HRB | 94.27 | HRB |
| Std Dev Btwn Labs | 0.40 | HRB | 0.42 | HRB |

Samples N69, N70 : Steel, Steel

Statistics based on 114 of 122 reporting participants



Analysis 1301

Rockwell Hardness: C & B Scales
ASTM E18

Comments on Assigned Data Flags for Test #1301

3W8X4X (X) - Extreme data.

3Z3VAF (X) - Data for sample N70 are high.

629VJF (X) - Data for both samples are low. Possible Systematic Error. Inconsistent within the determinations of both samples.

BED8FF (X) - Inconsistent in testing between samples.

CNK42X (X) - Data for both samples are low. Possible Systematic Error. Inconsistent within the determinations of both samples.

DGHB7A (X) - Data for both samples are high. Possible Systematic Error.

XKBXPY (X) - Data for sample N69 are low. Inconsistent within the determinations of sample N69.

ZGY9UR (X) - Data for sample N69 are low.



Analysis 1301

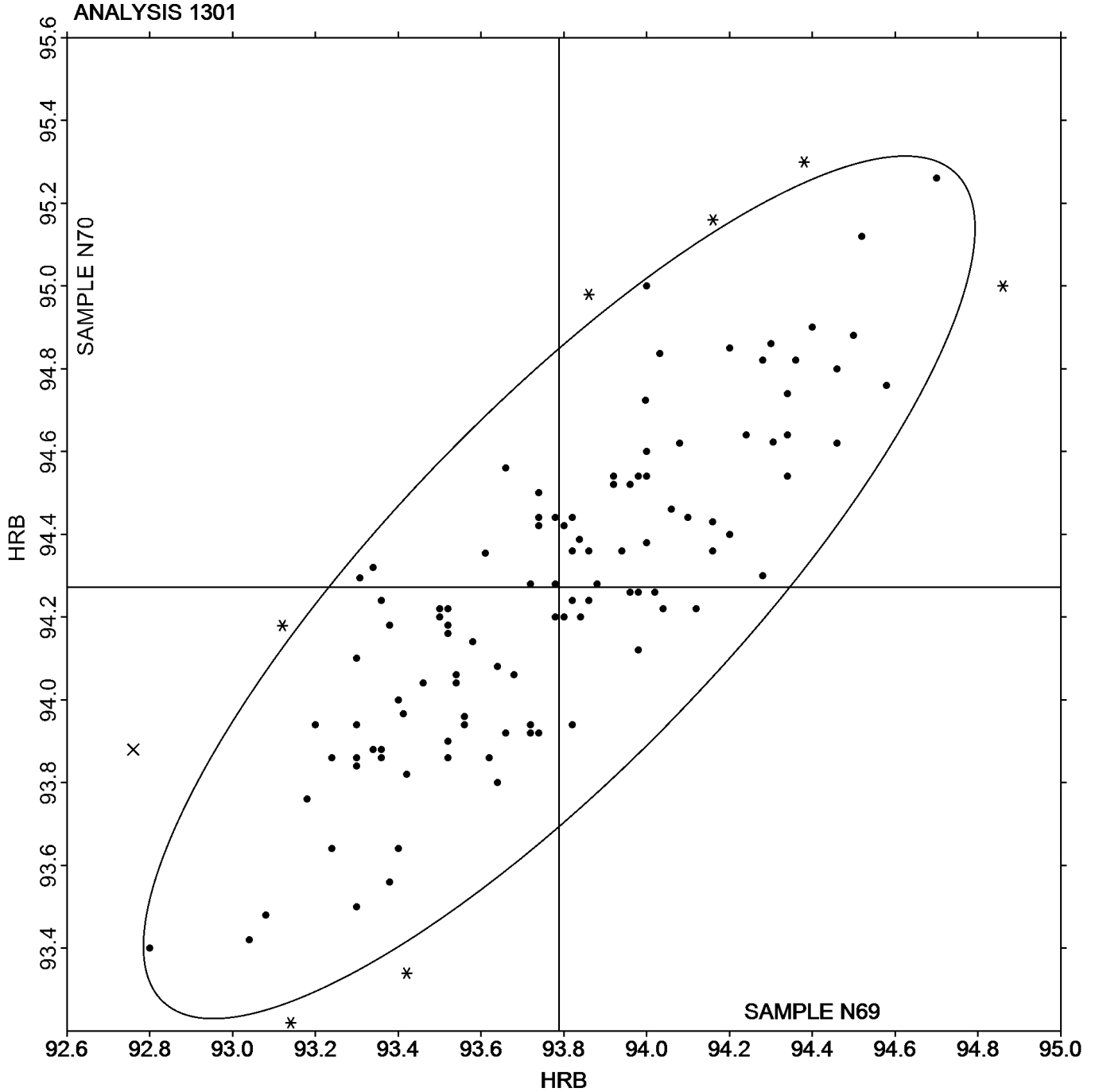
Rockwell Hardness: C & B Scales
ASTM E18

SAMPLE N69

93.79 HRB

SAMPLE N70

94.27 HRB





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1302

Rockwell Hardness: B Scale
ASTM E18

| WebCode | Data Flag | Sample N69 | | | Sample N70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2GKXZT | * | 95.24 | 1.18 | 2.05 | 95.14 | 0.57 | 1.02 |
| 3L7ACZ | | 94.48 | 0.42 | 0.73 | 95.04 | 0.47 | 0.84 |
| 3RC47W | | 93.86 | -0.20 | -0.35 | 94.42 | -0.15 | -0.26 |
| 43NWT9 | | 94.52 | 0.46 | 0.80 | 94.82 | 0.25 | 0.45 |
| 4434EQ | | 94.16 | 0.10 | 0.17 | 94.12 | -0.45 | -0.79 |
| 4B2Q7Q | | 95.30 | 1.24 | 2.15 | 95.86 | 1.29 | 2.30 |
| 4BMFCR | | 94.54 | 0.48 | 0.83 | 94.90 | 0.33 | 0.59 |
| 4DBQBW | | 93.80 | -0.26 | -0.45 | 94.54 | -0.03 | -0.04 |
| 4RRTNE | | 93.50 | -0.56 | -0.97 | 93.78 | -0.79 | -1.39 |
| 4WMH88 | | 94.34 | 0.28 | 0.49 | 94.62 | 0.05 | 0.10 |
| 6DMWYL | * | 92.80 | -1.26 | -2.19 | 94.00 | -0.57 | -1.00 |
| 798JYX | | 93.90 | -0.16 | -0.28 | 94.66 | 0.09 | 0.17 |
| 7V67NT | | 94.44 | 0.38 | 0.66 | 94.80 | 0.23 | 0.42 |
| 7ZHW6G | | 94.20 | 0.14 | 0.24 | 94.62 | 0.05 | 0.10 |
| 82L24M | | 93.10 | -0.96 | -1.66 | 94.00 | -0.57 | -1.00 |
| 84CCTV | | 93.70 | -0.36 | -0.62 | 94.40 | -0.17 | -0.29 |
| 8G3ZAN | | 94.34 | 0.28 | 0.49 | 94.68 | 0.11 | 0.20 |
| 8TRZGH | | 94.22 | 0.16 | 0.28 | 94.73 | 0.16 | 0.29 |
| 93CQGF | | 93.70 | -0.36 | -0.62 | 94.50 | -0.07 | -0.12 |
| 9A9N4H | | 94.00 | -0.06 | -0.10 | 94.80 | 0.23 | 0.42 |
| 9AVUQ3 | | 94.70 | 0.64 | 1.11 | 95.06 | 0.49 | 0.88 |
| 9DV7L3 | | 94.51 | 0.45 | 0.78 | 94.87 | 0.30 | 0.54 |
| A4K29C | | 94.54 | 0.48 | 0.83 | 95.06 | 0.49 | 0.88 |
| A6WZ4L | | 93.59 | -0.47 | -0.81 | 93.88 | -0.68 | -1.21 |
| AFWLEQ | | 93.24 | -0.82 | -1.42 | 93.68 | -0.89 | -1.57 |
| C2996N | | 93.00 | -1.06 | -1.84 | 93.50 | -1.07 | -1.89 |
| CCPVGA | | 94.68 | 0.62 | 1.08 | 94.86 | 0.29 | 0.52 |
| CEZZZQ | | 93.58 | -0.48 | -0.83 | 93.86 | -0.71 | -1.25 |
| CJMKXE | | 93.86 | -0.20 | -0.35 | 94.68 | 0.11 | 0.20 |
| CNXXFD | | 94.00 | -0.06 | -0.10 | 95.00 | 0.43 | 0.77 |
| CRJEXX | | 94.96 | 0.90 | 1.56 | 95.56 | 0.99 | 1.76 |
| DT9842 | | 93.92 | -0.14 | -0.24 | 94.72 | 0.15 | 0.27 |
| DZT49B | | 93.56 | -0.50 | -0.87 | 94.38 | -0.19 | -0.33 |
| EH6AXC | | 94.14 | 0.08 | 0.14 | 94.44 | -0.13 | -0.22 |
| EQWRAZ | | 94.06 | 0.00 | 0.00 | 94.32 | -0.25 | -0.43 |
| F7QPWG | | 94.54 | 0.48 | 0.83 | 95.04 | 0.47 | 0.84 |
| F862TZ | | 93.00 | -1.06 | -1.84 | 93.60 | -0.97 | -1.71 |
| FPMXBE | * | 92.50 | -1.56 | -2.71 | 93.48 | -1.09 | -1.92 |
| FYR37G | | 94.02 | -0.04 | -0.07 | 94.60 | 0.03 | 0.06 |
| G4JUQJ | | 94.46 | 0.40 | 0.70 | 94.82 | 0.25 | 0.45 |
| GHZUEW | | 93.24 | -0.82 | -1.42 | 93.78 | -0.79 | -1.39 |
| GV7QXY | | 95.02 | 0.96 | 1.67 | 95.56 | 0.99 | 1.76 |
| H2TXVX | | 93.12 | -0.94 | -1.63 | 93.48 | -1.09 | -1.92 |
| HRF2TC | | 95.14 | 1.08 | 1.87 | 95.28 | 0.71 | 1.27 |
| LCDBMP | | 93.78 | -0.28 | -0.49 | 94.22 | -0.35 | -0.61 |
| MJ9V6B | | 94.38 | 0.32 | 0.56 | 94.76 | 0.19 | 0.35 |
| NC9V69 | | 93.60 | -0.46 | -0.80 | 93.86 | -0.71 | -1.25 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1302

Rockwell Hardness: B Scale
ASTM E18

| WebCode | Data Flag | Sample N69 | | | Sample N70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| NNKXVD | | 94.24 | 0.18 | 0.31 | 94.94 | 0.37 | 0.66 |
| P7YUNC | | 94.38 | 0.32 | 0.56 | 94.84 | 0.27 | 0.49 |
| P7ZW8N | | 94.10 | 0.04 | 0.07 | 94.42 | -0.15 | -0.26 |
| PLV9N6 | * | 93.50 | -0.56 | -0.97 | 93.38 | -1.19 | -2.10 |
| PRG2Z6 | | 94.20 | 0.14 | 0.24 | 94.70 | 0.13 | 0.24 |
| QBMZFJ | | 95.15 | 1.09 | 1.89 | 95.80 | 1.23 | 2.19 |
| QXFBN | | 94.38 | 0.32 | 0.56 | 94.90 | 0.33 | 0.59 |
| R2Z4AB | | 94.44 | 0.38 | 0.66 | 94.98 | 0.41 | 0.74 |
| R8F3HV | | 93.92 | -0.14 | -0.24 | 94.80 | 0.23 | 0.42 |
| RUF4WJ | | 93.75 | -0.31 | -0.53 | 93.81 | -0.75 | -1.33 |
| U9N2PA | | 93.64 | -0.42 | -0.73 | 94.22 | -0.35 | -0.61 |
| UJMRGB | | 94.72 | 0.66 | 1.15 | 95.26 | 0.69 | 1.23 |
| V3GK28 | | 94.32 | 0.26 | 0.45 | 94.80 | 0.23 | 0.42 |
| VU3W4Y | | 93.82 | -0.24 | -0.42 | 94.48 | -0.09 | -0.15 |
| VU6QHX | * | 94.64 | 0.58 | 1.01 | 95.80 | 1.23 | 2.19 |
| WWPVU3 | | 93.66 | -0.40 | -0.69 | 94.02 | -0.55 | -0.97 |
| XJEUPV | | 94.32 | 0.26 | 0.45 | 94.70 | 0.13 | 0.24 |
| XL29E7 | | 94.20 | 0.14 | 0.24 | 94.78 | 0.21 | 0.38 |
| XUWBH3 | | 94.02 | -0.04 | -0.07 | 94.52 | -0.05 | -0.08 |
| YAK3HU | | 93.78 | -0.28 | -0.49 | 94.40 | -0.17 | -0.29 |
| YN6LDJ | | 94.46 | 0.40 | 0.69 | 95.04 | 0.47 | 0.84 |
| YQCTL4 | | 94.04 | -0.02 | -0.03 | 94.70 | 0.13 | 0.24 |
| Z98QFH | | 93.36 | -0.70 | -1.21 | 94.00 | -0.57 | -1.00 |
| ZM9KVX | | 94.20 | 0.14 | 0.24 | 94.70 | 0.13 | 0.24 |
| ZRKBCL | | 93.72 | -0.34 | -0.59 | 94.48 | -0.09 | -0.15 |
| ZYLHZ3 | | 94.10 | 0.04 | 0.07 | 94.00 | -0.57 | -1.00 |

Summary Statistics

| | Sample N69 | | Sample N70 | |
|--------------------------|------------|-----|------------|-----|
| Grand Means | 94.06 | HRB | 94.57 | HRB |
| Std Dev Btwn Labs | 0.58 | HRB | 0.56 | HRB |

Samples N69, N70 : Steel, Steel

Statistics based on 73 of 73 reporting participants



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1302

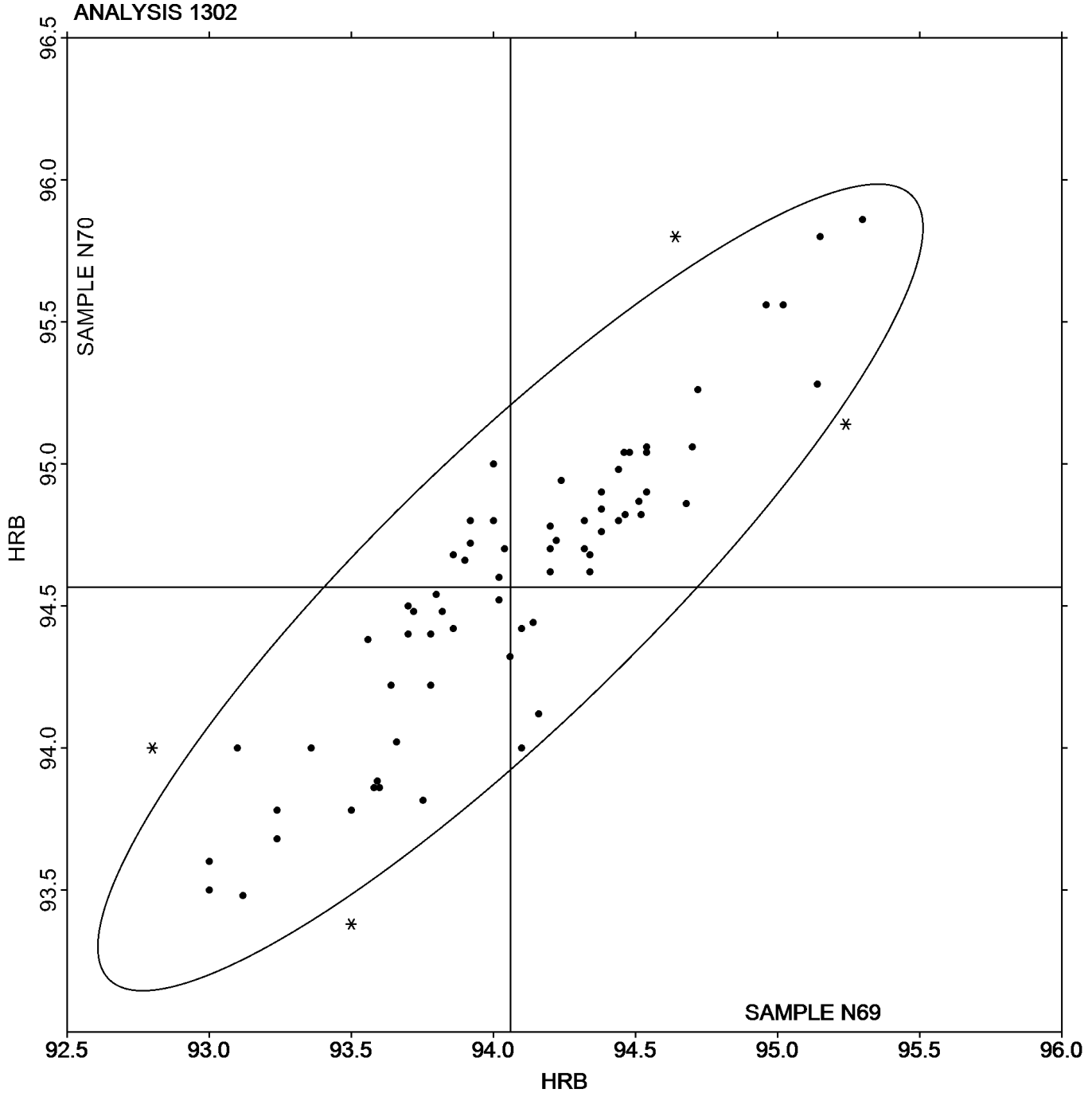
Rockwell Hardness: B Scale
ASTM E18

SAMPLE N69

94.06 HRB

SAMPLE N70

94.57 HRB





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1321

Microhardness: Knoop Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2KJ9VT | | 434.20 | -0.38 | -0.02 | 463.80 | 4.15 | 0.19 |
| 32KKWG | | 445.40 | 10.82 | 0.59 | 470.40 | 10.75 | 0.48 |
| 33UMQT | | 440.40 | 5.82 | 0.32 | 459.00 | -0.65 | -0.03 |
| 3FHP7Y | | 428.20 | -6.38 | -0.35 | 429.80 | -29.85 | -1.34 |
| 3H7BQA | | 445.80 | 11.22 | 0.62 | 452.80 | -6.85 | -0.31 |
| 3UFYPY | | 425.18 | -9.40 | -0.52 | 467.04 | 7.39 | 0.33 |
| 4434EQ | * | 382.00 | -52.58 | -2.89 | 409.60 | -50.05 | -2.24 |
| 4CWA8R | | 431.00 | -3.58 | -0.20 | 453.00 | -6.65 | -0.30 |
| 4E7ACY | | 429.40 | -5.18 | -0.28 | 441.60 | -18.05 | -0.81 |
| 4EZ6TF | | 414.80 | -19.78 | -1.09 | 461.32 | 1.67 | 0.07 |
| 4PZRKC | | 440.40 | 5.82 | 0.32 | 483.40 | 23.75 | 1.06 |
| 4YBU7D | | 446.60 | 12.02 | 0.66 | 482.40 | 22.75 | 1.02 |
| 627CFP | | 435.80 | 1.22 | 0.07 | 456.00 | -3.65 | -0.16 |
| 6NKVQR | | 420.60 | -13.98 | -0.77 | 459.80 | 0.15 | 0.01 |
| 6T2ZPM | | 418.00 | -16.58 | -0.91 | 451.00 | -8.65 | -0.39 |
| 8BRTL6 | | 463.75 | 29.18 | 1.60 | 495.06 | 35.41 | 1.58 |
| 8TRZGH | | 447.80 | 13.22 | 0.73 | 478.00 | 18.35 | 0.82 |
| 8VXLAN | * | 403.60 | -30.98 | -1.70 | 461.00 | 1.35 | 0.06 |
| 98PAZH | | 435.80 | 1.22 | 0.07 | 458.60 | -1.05 | -0.05 |
| 9E6BX7 | | 428.40 | -6.18 | -0.34 | 455.80 | -3.85 | -0.17 |
| 9JKHL6 | | 431.60 | -2.98 | -0.16 | 460.20 | 0.55 | 0.02 |
| 9QK6BK | | 450.00 | 15.42 | 0.85 | 473.40 | 13.75 | 0.61 |
| 9ZLKZP | | 458.72 | 24.14 | 1.32 | 476.04 | 16.39 | 0.73 |
| A7RJ6M | | 462.00 | 27.42 | 1.50 | 508.00 | 48.35 | 2.16 |
| AKPP24 | | 450.60 | 16.02 | 0.88 | 483.60 | 23.95 | 1.07 |
| AP49K7 | | 432.84 | -1.74 | -0.10 | 464.06 | 4.41 | 0.20 |
| AV7GMR | | 455.40 | 20.82 | 1.14 | 484.40 | 24.75 | 1.11 |
| B372M3 | | 399.00 | -35.58 | -1.95 | 408.00 | -51.65 | -2.31 |
| BBJZ6K | | 426.00 | -8.58 | -0.47 | 438.40 | -21.25 | -0.95 |
| BP4HXN | | 443.20 | 8.62 | 0.47 | 474.00 | 14.35 | 0.64 |
| CTVAJP | | 425.20 | -9.38 | -0.51 | 468.20 | 8.55 | 0.38 |
| D482FX | | 416.40 | -18.18 | -1.00 | 457.80 | -1.85 | -0.08 |
| D8QVG6 | | 396.00 | -38.58 | -2.12 | 409.60 | -50.05 | -2.24 |
| DGHB7A | | 444.80 | 10.22 | 0.56 | 467.60 | 7.95 | 0.36 |
| DKGRGH | | 436.96 | 2.38 | 0.13 | 466.05 | 6.40 | 0.29 |
| DQN9XJ | | 450.78 | 16.20 | 0.89 | 471.54 | 11.89 | 0.53 |
| DZT49B | | 439.92 | 5.34 | 0.29 | 471.12 | 11.47 | 0.51 |
| E2G2ZE | | 434.40 | -0.18 | -0.01 | 469.60 | 9.95 | 0.44 |
| EFHXWL | | 439.40 | 4.82 | 0.26 | 437.20 | -22.45 | -1.00 |
| F3CVGJ | | 445.20 | 10.62 | 0.58 | 469.40 | 9.75 | 0.44 |
| F862TZ | | 464.60 | 30.02 | 1.65 | 500.00 | 40.35 | 1.80 |
| F8KKDX | | 434.98 | 0.40 | 0.02 | 435.74 | -23.91 | -1.07 |
| F9CNZD | | 440.00 | 5.42 | 0.30 | 476.20 | 16.55 | 0.74 |
| FD7H3K | | 417.00 | -17.58 | -0.96 | 463.00 | 3.35 | 0.15 |
| G4JUQJ | | 420.67 | -13.91 | -0.76 | 434.00 | -25.65 | -1.15 |
| GMFXUE | | 413.00 | -21.58 | -1.18 | 424.20 | -35.45 | -1.59 |
| H4U36B | | 432.80 | -1.78 | -0.10 | 425.60 | -34.05 | -1.52 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1321

Microhardness: Knoop Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| H9M6CH | X | 442.00 | 7.42 | 0.41 | 421.60 | -38.05 | -1.70 |
| HX4QBZ | | 449.80 | 15.22 | 0.84 | 478.20 | 18.55 | 0.83 |
| J4BEN3 | | 439.20 | 4.62 | 0.25 | 470.00 | 10.35 | 0.46 |
| J8BMTc | | 443.60 | 9.02 | 0.50 | 471.40 | 11.75 | 0.53 |
| JP6KV6 | | 413.52 | -21.06 | -1.16 | 445.46 | -14.19 | -0.63 |
| JRGZP6 | | 425.60 | -8.98 | -0.49 | 453.40 | -6.25 | -0.28 |
| JTA42D | | 442.20 | 7.62 | 0.42 | 467.20 | 7.55 | 0.34 |
| JTTWUA | | 431.80 | -2.78 | -0.15 | 453.20 | -6.45 | -0.29 |
| KJMALA | | 426.10 | -8.48 | -0.47 | 419.70 | -39.95 | -1.79 |
| KMWRFW | | 457.40 | 22.82 | 1.25 | 469.40 | 9.75 | 0.44 |
| KUMXGD | * | 384.18 | -50.40 | -2.77 | 407.80 | -51.85 | -2.32 |
| KUZC2F | * | 438.60 | 4.02 | 0.22 | 426.00 | -33.65 | -1.50 |
| LVBV6A | X | 447.20 | 12.62 | 0.69 | 422.40 | -37.25 | -1.67 |
| MLZUJA | | 440.40 | 5.82 | 0.32 | 471.00 | 11.35 | 0.51 |
| MNMDK8 | | 435.40 | 0.82 | 0.05 | 429.60 | -30.05 | -1.34 |
| MYL9FG | | 426.60 | -7.98 | -0.44 | 459.40 | -0.25 | -0.01 |
| NEW9PC | | 472.80 | 38.22 | 2.10 | 508.00 | 48.35 | 2.16 |
| NPVXR8 | * | 392.80 | -41.78 | -2.29 | 439.20 | -20.45 | -0.91 |
| NTCEW6 | * | 485.40 | 50.82 | 2.79 | 519.20 | 59.55 | 2.66 |
| NXLM7M | | 460.40 | 25.82 | 1.42 | 470.60 | 10.95 | 0.49 |
| P7W9QB | X | 447.40 | 12.82 | 0.70 | 424.40 | -35.25 | -1.58 |
| P7ZW8N | | 423.00 | -11.58 | -0.64 | 453.00 | -6.65 | -0.30 |
| P93RQR | X | 424.48 | -10.10 | -0.55 | 509.02 | 49.37 | 2.21 |
| PVZ7N3 | | 426.36 | -8.22 | -0.45 | 446.44 | -13.21 | -0.59 |
| Q7EFRL | | 443.18 | 8.60 | 0.47 | 454.54 | -5.11 | -0.23 |
| QT3ET8 | X | 388.80 | -45.78 | -2.51 | 460.40 | 0.75 | 0.03 |
| R6APU3 | | 453.20 | 18.62 | 1.02 | 475.20 | 15.55 | 0.70 |
| R82JXX | | 421.80 | -12.78 | -0.70 | 431.20 | -28.45 | -1.27 |
| R8F3HV | | 432.74 | -1.84 | -0.10 | 461.62 | 1.97 | 0.09 |
| REZ3YT | | 420.00 | -14.58 | -0.80 | 432.00 | -27.65 | -1.24 |
| RHZET9 | | 435.40 | 0.82 | 0.05 | 459.20 | -0.45 | -0.02 |
| RKTX68 | | 453.60 | 19.02 | 1.04 | 470.80 | 11.15 | 0.50 |
| T3693Q | | 447.00 | 12.42 | 0.68 | 485.80 | 26.15 | 1.17 |
| T6VDY4 | | 400.68 | -33.90 | -1.86 | 422.82 | -36.83 | -1.65 |
| TANEYW | | 431.20 | -3.38 | -0.19 | 459.00 | -0.65 | -0.03 |
| TN6AET | | 433.00 | -1.58 | -0.09 | 456.60 | -3.05 | -0.14 |
| TV7MBQ | | 436.80 | 2.22 | 0.12 | 468.00 | 8.35 | 0.37 |
| UXRLB7 | | 418.00 | -16.58 | -0.91 | 426.20 | -33.45 | -1.50 |
| V28HAG | | 414.20 | -20.38 | -1.12 | 437.40 | -22.25 | -1.00 |
| VKXX6X | | 453.00 | 18.42 | 1.01 | 484.40 | 24.75 | 1.11 |
| VU3W4Y | | 439.20 | 4.62 | 0.25 | 476.40 | 16.75 | 0.75 |
| VWT8R7 | | 457.39 | 22.81 | 1.25 | 496.28 | 36.63 | 1.64 |
| VWVTQ8 | | 433.20 | -1.38 | -0.08 | 455.00 | -4.65 | -0.21 |
| W48D44 | | 428.96 | -5.62 | -0.31 | 452.57 | -7.08 | -0.32 |
| W6ZWF3 | X | 481.60 | 47.02 | 2.58 | 552.60 | 92.95 | 4.16 |
| WM3W4W | | 420.60 | -13.98 | -0.77 | 441.80 | -17.85 | -0.80 |
| WPNU8T | | 409.40 | -25.18 | -1.38 | 451.40 | -8.25 | -0.37 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1321

Microhardness: Knoop Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| WRQLHE | | 439.60 | 5.02 | 0.28 | 469.76 | 10.11 | 0.45 |
| X8L4D6 | | 437.80 | 3.22 | 0.18 | 460.76 | 1.11 | 0.05 |
| YAK3HU | | 466.60 | 32.02 | 1.76 | 489.40 | 29.75 | 1.33 |
| YXALUX | | 439.00 | 4.42 | 0.24 | 471.20 | 11.55 | 0.52 |
| ZC78RC | | 441.80 | 7.22 | 0.40 | 466.74 | 7.09 | 0.32 |
| ZGY9UR | | 436.40 | 1.82 | 0.10 | 457.60 | -2.05 | -0.09 |
| ZM9KVX | | 429.40 | -5.18 | -0.28 | 468.40 | 8.75 | 0.39 |
| ZNJAA4 | | 452.60 | 18.02 | 0.99 | 480.20 | 20.55 | 0.92 |

Summary Statistics

| | Sample S69 | | Sample S70 | |
|---------------------------|------------|-----------|------------|-----------|
| Grand Means | 434.58 | HK 500 gf | 459.65 | HK 500 gf |
| Stnd Dev Brwn Labs | 18.22 | HK 500 gf | 22.36 | HK 500 gf |

Samples S69, S70 : Steel, Steel

Statistics based on 96 of 102 reporting participants

Comments on Assigned Data Flags for Test #1321

- H9M6CH (X) - Inconsistent in testing between samples.
- LVBV6A (X) - Inconsistent in testing between samples.
- P7W9QB (X) - Inconsistent in testing between samples.
- P93RQR (X) - Inconsistent in testing between samples.
- QT3ET8 (X) - Inconsistent in testing between samples.
- W6ZWF3 (X) - Data for sample S70 are high. Inconsistent within the determinations of both samples.

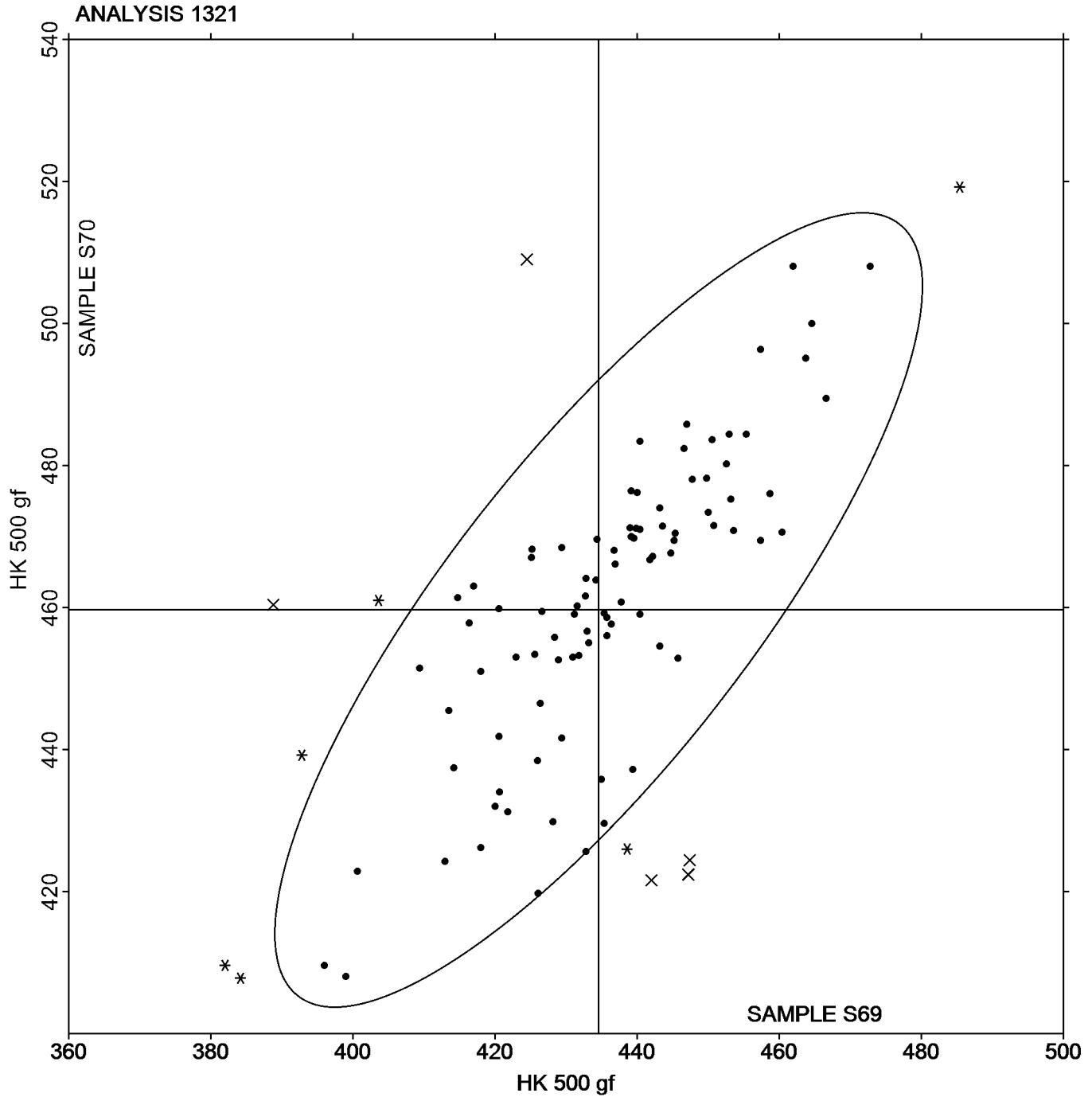


Analysis 1321

Microhardness: Knoop Indenters (500 gf)
ASTM E384

SAMPLE S69
434.58 HK 500 gf

SAMPLE S70
459.65 HK 500 gf





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1322

Microhardness: Knoop Indenters (200 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2KJ9VT | | 444.20 | -4.54 | -0.23 | 478.40 | 3.72 | 0.16 |
| 33UMQT | | 451.20 | 2.46 | 0.12 | 479.60 | 4.92 | 0.21 |
| 3FHP7Y | | 446.80 | -1.94 | -0.10 | 434.40 | -40.28 | -1.76 |
| 3H7BQA | | 444.80 | -3.94 | -0.20 | 487.80 | 13.12 | 0.57 |
| 4CWA8R | | 441.80 | -6.94 | -0.34 | 463.00 | -11.68 | -0.51 |
| 4E7ACY | | 423.80 | -24.94 | -1.24 | 439.40 | -35.28 | -1.54 |
| 4EZ6TF | | 437.74 | -11.00 | -0.55 | 472.94 | -1.74 | -0.08 |
| 4YBU7D | | 462.80 | 14.06 | 0.70 | 486.40 | 11.72 | 0.51 |
| 627CFP | | 447.20 | -1.54 | -0.08 | 464.60 | -10.08 | -0.44 |
| 6NKVQR | | 436.00 | -12.74 | -0.63 | 477.00 | 2.32 | 0.10 |
| 6T2ZPM | | 436.80 | -11.94 | -0.59 | 477.00 | 2.32 | 0.10 |
| 8BRTL6 | * | 499.53 | 50.79 | 2.53 | 528.23 | 53.55 | 2.33 |
| 8TRZGH | | 449.60 | 0.86 | 0.04 | 481.60 | 6.92 | 0.30 |
| 8VXLAN | | 425.00 | -23.74 | -1.18 | 468.00 | -6.68 | -0.29 |
| 9QK6BK | | 462.20 | 13.46 | 0.67 | 495.00 | 20.32 | 0.89 |
| A7RJ6M | | 454.80 | 6.06 | 0.30 | 485.00 | 10.32 | 0.45 |
| AKPP24 | | 463.80 | 15.06 | 0.75 | 495.00 | 20.32 | 0.89 |
| AP49K7 | | 457.28 | 8.54 | 0.42 | 488.20 | 13.52 | 0.59 |
| AV7GMR | | 456.80 | 8.06 | 0.40 | 485.20 | 10.52 | 0.46 |
| B372M3 | | 413.80 | -34.94 | -1.74 | 441.80 | -32.88 | -1.43 |
| BBJZ6K | | 437.20 | -11.54 | -0.57 | 448.20 | -26.48 | -1.15 |
| CTVAJP | | 437.40 | -11.34 | -0.56 | 484.60 | 9.92 | 0.43 |
| D8QVG6 | | 404.60 | -44.14 | -2.20 | 439.80 | -34.88 | -1.52 |
| DKGRGH | | 452.12 | 3.38 | 0.17 | 483.61 | 8.93 | 0.39 |
| DQN9XJ | | 477.62 | 28.88 | 1.44 | 491.36 | 16.68 | 0.73 |
| DZT49B | | 451.04 | 2.30 | 0.11 | 469.70 | -4.98 | -0.22 |
| E2G2ZE | | 456.80 | 8.06 | 0.40 | 486.60 | 11.92 | 0.52 |
| F3CVGJ | | 455.80 | 7.06 | 0.35 | 483.60 | 8.92 | 0.39 |
| F862TZ | | 470.20 | 21.46 | 1.07 | 509.20 | 34.52 | 1.50 |
| F8KKDX | | 451.72 | 2.98 | 0.15 | 454.12 | -20.56 | -0.90 |
| F9CNZD | X | 443.20 | -5.54 | -0.28 | 553.60 | 78.92 | 3.44 |
| FD7H3K | | 418.20 | -30.54 | -1.52 | 477.60 | 2.92 | 0.13 |
| G4JUQJ | | 421.67 | -27.07 | -1.35 | 447.00 | -27.68 | -1.21 |
| GMFXUE | | 422.80 | -25.94 | -1.29 | 426.60 | -48.08 | -2.10 |
| H4U36B | * | 465.80 | 17.06 | 0.85 | 446.60 | -28.08 | -1.22 |
| H9M6CH | | 445.60 | -3.14 | -0.16 | 431.80 | -42.88 | -1.87 |
| HX4QBZ | | 468.60 | 19.86 | 0.99 | 487.80 | 13.12 | 0.57 |
| JTA42D | | 453.40 | 4.66 | 0.23 | 476.60 | 1.92 | 0.08 |
| KJMALA | | 424.96 | -23.78 | -1.18 | 435.76 | -38.92 | -1.70 |
| KMWRFW | | 468.20 | 19.46 | 0.97 | 484.20 | 9.52 | 0.41 |
| KUZC2F | | 448.40 | -0.34 | -0.02 | 443.40 | -31.28 | -1.36 |
| LVBV6A | X | 471.60 | 22.86 | 1.14 | 423.40 | -51.28 | -2.23 |
| NEW9PC | * | 410.20 | -38.54 | -1.92 | 480.40 | 5.72 | 0.25 |
| NXLM7M | | 474.00 | 25.26 | 1.26 | 508.40 | 33.72 | 1.47 |
| P7W9QB | | 447.00 | -1.74 | -0.09 | 440.80 | -33.88 | -1.48 |
| P7ZW8N | | 442.60 | -6.14 | -0.31 | 478.40 | 3.72 | 0.16 |
| P93RQR | | 441.80 | -6.94 | -0.34 | 494.16 | 19.48 | 0.85 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1322

Microhardness: Knoop Indenters (200 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| QT3ET8 | * | 405.20 | -43.54 | -2.17 | 475.60 | 0.92 | 0.04 |
| R82JXX | | 432.40 | -16.34 | -0.81 | 444.40 | -30.28 | -1.32 |
| R8F3HV | | 450.46 | 1.72 | 0.09 | 471.86 | -2.82 | -0.12 |
| REZ3YT | | 426.00 | -22.74 | -1.13 | 441.40 | -33.28 | -1.45 |
| RKTX68 | | 487.20 | 38.46 | 1.91 | 501.80 | 27.12 | 1.18 |
| T3693Q | | 444.60 | -4.14 | -0.21 | 487.80 | 13.12 | 0.57 |
| T6VDY4 | | 432.22 | -16.52 | -0.82 | 452.76 | -21.92 | -0.96 |
| TV7MBQ | * | 500.40 | 51.66 | 2.57 | 525.40 | 50.72 | 2.21 |
| VKXX6X | | 455.80 | 7.06 | 0.35 | 493.20 | 18.52 | 0.81 |
| VU3W4Y | | 448.00 | -0.74 | -0.04 | 480.80 | 6.12 | 0.27 |
| VWT8R7 | | 458.82 | 10.08 | 0.50 | 499.69 | 25.01 | 1.09 |
| VWVTQ8 | | 437.00 | -11.74 | -0.58 | 464.00 | -10.68 | -0.47 |
| W48D44 | | 459.44 | 10.71 | 0.53 | 462.29 | -12.39 | -0.54 |
| W6ZWF3 | | 478.00 | 29.26 | 1.46 | 505.60 | 30.92 | 1.35 |
| X8L4D6 | | 448.92 | 0.18 | 0.01 | 487.34 | 12.66 | 0.55 |
| YAK3HU | | 480.40 | 31.66 | 1.57 | 501.40 | 26.72 | 1.16 |
| YXALUX | | 456.20 | 7.46 | 0.37 | 486.80 | 12.12 | 0.53 |
| ZC78RC | | 445.26 | -3.48 | -0.17 | 469.82 | -4.86 | -0.21 |
| ZGY9UR | | 453.00 | 4.26 | 0.21 | 472.20 | -2.48 | -0.11 |
| ZNJAA4 | | 464.80 | 16.06 | 0.80 | 491.40 | 16.72 | 0.73 |

Summary Statistics

| | Sample S69 | | Sample S70 | |
|--------------------------|------------|-----------|------------|-----------|
| Grand Means | 448.74 | HK 200 gf | 474.68 | HK 200 gf |
| Std Dev Btwn Labs | 20.11 | HK 200 gf | 22.95 | HK 200 gf |

Samples S69, S70 : Steel, Steel

Statistics based on 65 of 67 reporting participants

Comments on Assigned Data Flags for Test #1322

F9CNZD (X) - Data for sample S70 are high.

LVBV6A (X) - Inconsistent in testing between samples.

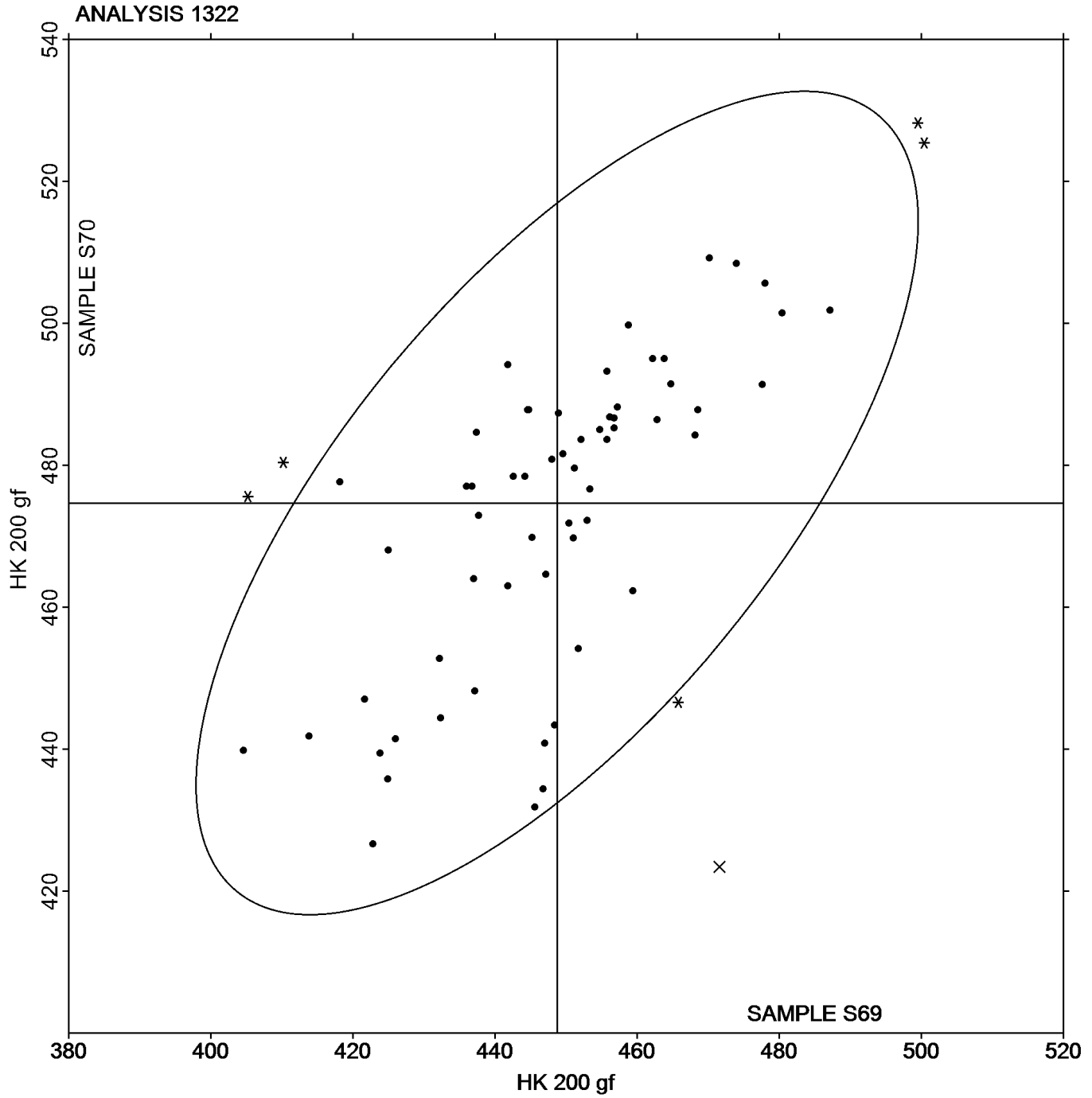


Analysis 1322

Microhardness: Knoop Indenters (200 gf)
ASTM E384

SAMPLE S69
448.74 HK 200 gf

SAMPLE S70
474.68 HK 200 gf





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1323

Microhardness: Vickers Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 2KJ9VT | | 409.80 | -2.84 | -0.15 | 435.20 | -6.10 | -0.29 |
| 2MKL9K | | 414.04 | 1.40 | 0.08 | 424.00 | -17.30 | -0.84 |
| 2TCQ7V | | 422.38 | 9.74 | 0.52 | 457.72 | 16.42 | 0.79 |
| 33UMQT | | 423.80 | 11.16 | 0.60 | 448.20 | 6.90 | 0.33 |
| 3BNWRB | | 426.80 | 14.16 | 0.76 | 466.40 | 25.10 | 1.21 |
| 3FHP7Y | X | 410.80 | -1.84 | -0.10 | 407.20 | -34.10 | -1.65 |
| 3H7BQA | | 412.40 | -0.24 | -0.01 | 429.00 | -12.30 | -0.59 |
| 3JHXDV | | 390.40 | -22.24 | -1.20 | 439.80 | -1.50 | -0.07 |
| 3L3WFR | | 405.26 | -7.38 | -0.40 | 455.32 | 14.02 | 0.68 |
| 3UFYPY | | 414.82 | 2.18 | 0.12 | 440.90 | -0.40 | -0.02 |
| 3YTTTR | | 385.60 | -27.04 | -1.45 | 406.80 | -34.50 | -1.67 |
| 4434EQ | * | 363.80 | -48.84 | -2.63 | 400.60 | -40.70 | -1.96 |
| 4CCTUA | | 430.12 | 17.48 | 0.94 | 461.00 | 19.70 | 0.95 |
| 4CWA8R | | 413.60 | 0.96 | 0.05 | 446.80 | 5.50 | 0.27 |
| 4E7ACY | | 396.00 | -16.64 | -0.89 | 419.40 | -21.90 | -1.06 |
| 4EZ6TF | | 416.92 | 4.28 | 0.23 | 447.26 | 5.96 | 0.29 |
| 4KTZYU | | 427.00 | 14.36 | 0.77 | 453.20 | 11.90 | 0.57 |
| 4YBU7D | | 429.60 | 16.96 | 0.91 | 458.80 | 17.50 | 0.84 |
| 627CFP | | 417.00 | 4.36 | 0.23 | 438.20 | -3.10 | -0.15 |
| 6JQY4L | | 422.24 | 9.60 | 0.52 | 447.12 | 5.82 | 0.28 |
| 6NKVQR | | 388.60 | -24.04 | -1.29 | 434.00 | -7.30 | -0.35 |
| 6RLRKT | | 439.22 | 26.58 | 1.43 | 460.40 | 19.10 | 0.92 |
| 6T2ZPM | | 416.60 | 3.96 | 0.21 | 446.00 | 4.70 | 0.23 |
| 8E9FYA | | 418.80 | 6.16 | 0.33 | 440.40 | -0.90 | -0.04 |
| 8TRZGH | | 423.60 | 10.96 | 0.59 | 462.20 | 20.90 | 1.01 |
| 9DV7L3 | * | 358.60 | -54.04 | -2.91 | 383.20 | -58.10 | -2.80 |
| 9E6BX7 | | 419.00 | 6.36 | 0.34 | 449.60 | 8.30 | 0.40 |
| 9JKHL6 | | 411.60 | -1.04 | -0.06 | 438.80 | -2.50 | -0.12 |
| 9NU2FR | | 411.00 | -1.64 | -0.09 | 437.20 | -4.10 | -0.20 |
| 9QK6BK | | 425.40 | 12.76 | 0.69 | 457.60 | 16.30 | 0.79 |
| 9W7Z8H | | 415.20 | 2.56 | 0.14 | 450.20 | 8.90 | 0.43 |
| A7RJ6M | | 421.80 | 9.16 | 0.49 | 466.80 | 25.50 | 1.23 |
| AB4GLM | X | 388.54 | -24.10 | -1.30 | 386.88 | -54.42 | -2.63 |
| AKPP24 | | 430.60 | 17.96 | 0.97 | 461.00 | 19.70 | 0.95 |
| AV7GMR | | 424.20 | 11.56 | 0.62 | 451.60 | 10.30 | 0.50 |
| B372M3 | * | 365.40 | -47.24 | -2.54 | 388.00 | -53.30 | -2.57 |
| BBJZ6K | | 416.80 | 4.16 | 0.22 | 431.00 | -10.30 | -0.50 |
| BEFWKD | X | 367.44 | -45.20 | -2.43 | 421.34 | -19.96 | -0.96 |
| BG49JH | | 407.84 | -4.80 | -0.26 | 433.66 | -7.64 | -0.37 |
| BP4HXN | | 424.60 | 11.96 | 0.64 | 454.80 | 13.50 | 0.65 |
| CHXDE3 | | 377.60 | -35.04 | -1.88 | 407.20 | -34.10 | -1.65 |
| CTVAJP | | 414.20 | 1.56 | 0.08 | 463.60 | 22.30 | 1.08 |
| D482FX | | 387.40 | -25.24 | -1.36 | 421.20 | -20.10 | -0.97 |
| D7YZUW | | 407.40 | -5.24 | -0.28 | 445.00 | 3.70 | 0.18 |
| D8QVG6 | * | 358.80 | -53.84 | -2.90 | 377.40 | -63.90 | -3.08 |
| DKGRGH | | 425.36 | 12.72 | 0.68 | 447.41 | 6.11 | 0.29 |
| DKJFZG | | 410.32 | -2.32 | -0.12 | 447.72 | 6.42 | 0.31 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1323

Microhardness: Vickers Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| DZT49B | | 412.32 | -0.32 | -0.02 | 437.12 | -4.18 | -0.20 |
| E2G2ZE | | 421.80 | 9.16 | 0.49 | 454.80 | 13.50 | 0.65 |
| EEQPWH | | 400.60 | -12.04 | -0.65 | 449.30 | 8.00 | 0.39 |
| EFHXWL | | 415.60 | 2.96 | 0.16 | 437.20 | -4.10 | -0.20 |
| EL8BXA | | 432.70 | 20.06 | 1.08 | 452.92 | 11.62 | 0.56 |
| F3CVGJ | | 428.00 | 15.36 | 0.83 | 452.60 | 11.30 | 0.55 |
| F862TZ | | 419.40 | 6.76 | 0.36 | 460.60 | 19.30 | 0.93 |
| F8KKDX | * | 415.28 | 2.64 | 0.14 | 414.96 | -26.34 | -1.27 |
| F9CNZD | | 411.80 | -0.84 | -0.04 | 452.60 | 11.30 | 0.55 |
| FD7H3K | * | 385.20 | -27.44 | -1.48 | 433.60 | -7.70 | -0.37 |
| FRALME | | 371.40 | -41.24 | -2.22 | 401.80 | -39.50 | -1.91 |
| G2AQW8 | * | 368.60 | -44.04 | -2.37 | 414.20 | -27.10 | -1.31 |
| G2U8CA | | 429.00 | 16.36 | 0.88 | 454.20 | 12.90 | 0.62 |
| G4JUQJ | | 388.00 | -24.64 | -1.32 | 411.00 | -30.30 | -1.46 |
| G6BQFC | | 413.04 | 0.40 | 0.02 | 429.58 | -11.72 | -0.57 |
| GBLLFF | | 435.60 | 22.96 | 1.23 | 474.40 | 33.10 | 1.60 |
| GHZUEW | | 426.02 | 13.38 | 0.72 | 459.16 | 17.86 | 0.86 |
| GMFXUE | | 389.20 | -23.44 | -1.26 | 401.40 | -39.90 | -1.93 |
| GTGE2E | X | 44.20 | -368.44 | -19.81 | 47.50 | -393.80 | -19.00 |
| GY62UX | | 416.60 | 3.96 | 0.21 | 443.40 | 2.10 | 0.10 |
| H2TXVX | | 425.80 | 13.16 | 0.71 | 469.00 | 27.70 | 1.34 |
| H4U36B | X | 403.80 | -8.84 | -0.48 | 397.60 | -43.70 | -2.11 |
| H9M6CH | | 420.20 | 7.56 | 0.41 | 432.60 | -8.70 | -0.42 |
| HBFPNG | | 424.22 | 11.58 | 0.62 | 461.66 | 20.36 | 0.98 |
| HPVWG8 | | 428.34 | 15.70 | 0.84 | 462.88 | 21.58 | 1.04 |
| HX4QBZ | | 430.00 | 17.36 | 0.93 | 455.00 | 13.70 | 0.66 |
| J4BEN3 | | 406.80 | -5.84 | -0.31 | 440.80 | -0.50 | -0.02 |
| J8BMTc | X | 443.20 | 30.56 | 1.64 | 422.00 | -19.30 | -0.93 |
| JC4RKV | | 422.80 | 10.16 | 0.55 | 446.40 | 5.10 | 0.25 |
| JP6KV6 | | 398.48 | -14.16 | -0.76 | 427.16 | -14.14 | -0.68 |
| JTA42D | | 414.60 | 1.96 | 0.11 | 433.40 | -7.90 | -0.38 |
| KMWRFW | | 427.40 | 14.76 | 0.79 | 445.60 | 4.30 | 0.21 |
| KUMXGD | * | 360.00 | -52.64 | -2.83 | 387.62 | -53.68 | -2.59 |
| KUZC2F | X | 416.40 | 3.76 | 0.20 | 408.80 | -32.50 | -1.57 |
| L2FTRG | | 407.20 | -5.44 | -0.29 | 437.00 | -4.30 | -0.21 |
| LVBV6A | X | 424.40 | 11.76 | 0.63 | 403.00 | -38.30 | -1.85 |
| MC9DPY | X | 428.15 | 15.51 | 0.83 | 420.07 | -21.23 | -1.02 |
| MLFD47 | * | 366.00 | -46.64 | -2.51 | 384.40 | -56.90 | -2.75 |
| MLZUJA | | 418.20 | 5.56 | 0.30 | 454.00 | 12.70 | 0.61 |
| MYL9FG | | 416.60 | 3.96 | 0.21 | 450.00 | 8.70 | 0.42 |
| MYQG7B | | 416.22 | 3.58 | 0.19 | 445.30 | 4.00 | 0.19 |
| N7JH4L | | 421.20 | 8.56 | 0.46 | 448.00 | 6.70 | 0.32 |
| ND72QA | | 420.20 | 7.56 | 0.41 | 448.40 | 7.10 | 0.34 |
| NEW9PC | | 408.60 | -4.04 | -0.22 | 454.80 | 13.50 | 0.65 |
| NXLM7M | | 424.20 | 11.56 | 0.62 | 453.20 | 11.90 | 0.57 |
| P7W9QB | X | 417.80 | 5.16 | 0.28 | 405.60 | -35.70 | -1.72 |
| P7ZW8N | | 395.80 | -16.84 | -0.91 | 418.60 | -22.70 | -1.10 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1323

Microhardness: Vickers Indenters (500 gf)
ASTM E384

| WebCode | Data Flag | Sample S69 | | | Sample S70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| P93RQR | | 410.08 | -2.56 | -0.14 | 442.58 | 1.28 | 0.06 |
| PBUNLD | | 442.40 | 29.76 | 1.60 | 484.80 | 43.50 | 2.10 |
| PDVY9Z | | 435.48 | 22.84 | 1.23 | 466.70 | 25.40 | 1.23 |
| PLV9N6 | | 387.00 | -25.64 | -1.38 | 397.60 | -43.70 | -2.11 |
| PVZ7N3 | | 410.18 | -2.46 | -0.13 | 425.82 | -15.48 | -0.75 |
| QM2Z6K | | 435.00 | 22.36 | 1.20 | 469.20 | 27.90 | 1.35 |
| QM6DY9 | X | 434.80 | 22.16 | 1.19 | 374.60 | -66.70 | -3.22 |
| QMY9FP | | 426.24 | 13.60 | 0.73 | 456.82 | 15.52 | 0.75 |
| QPNHN7 | X | 40.68 | -371.96 | -20.00 | 45.18 | -396.12 | -19.12 |
| QT3ET8 | X | 352.60 | -60.04 | -3.23 | 439.20 | -2.10 | -0.10 |
| QXFXBN | * | 369.48 | -43.16 | -2.32 | 409.46 | -31.84 | -1.54 |
| R6APU3 | | 429.80 | 17.16 | 0.92 | 451.20 | 9.90 | 0.48 |
| R82JXX | | 403.40 | -9.24 | -0.50 | 432.80 | -8.50 | -0.41 |
| R8F3HV | | 418.60 | 5.96 | 0.32 | 441.18 | -0.12 | -0.01 |
| REZ3YT | | 416.40 | 3.76 | 0.20 | 436.20 | -5.10 | -0.25 |
| RHZET9 | | 406.96 | -5.68 | -0.31 | 443.96 | 2.66 | 0.13 |
| RKTX68 | | 422.40 | 9.76 | 0.53 | 431.00 | -10.30 | -0.50 |
| T3693Q | | 437.20 | 24.56 | 1.32 | 479.60 | 38.30 | 1.85 |
| T6VDY4 | | 401.38 | -11.26 | -0.61 | 429.90 | -11.40 | -0.55 |
| T8Z3ZR | | 395.66 | -16.98 | -0.91 | 417.20 | -24.10 | -1.16 |
| TN6AET | | 408.80 | -3.84 | -0.21 | 429.60 | -11.70 | -0.56 |
| TZJHYZ | | 441.60 | 28.96 | 1.56 | 460.40 | 19.10 | 0.92 |
| U9N2PA | | 421.26 | 8.62 | 0.46 | 441.08 | -0.22 | -0.01 |
| UPDZ23 | | 434.60 | 21.96 | 1.18 | 470.20 | 28.90 | 1.39 |
| V28HAG | | 397.40 | -15.24 | -0.82 | 431.40 | -9.90 | -0.48 |
| VDCZHV | | 421.00 | 8.36 | 0.45 | 450.00 | 8.70 | 0.42 |
| VKXX6X | | 424.60 | 11.96 | 0.64 | 452.60 | 11.30 | 0.55 |
| VM2NDX | X | 386.00 | -26.64 | -1.43 | 455.40 | 14.10 | 0.68 |
| VU3W4Y | | 422.60 | 9.96 | 0.54 | 455.60 | 14.30 | 0.69 |
| VWT8R7 | | 438.62 | 25.98 | 1.40 | 472.11 | 30.81 | 1.49 |
| VWVTQ8 | | 418.68 | 6.04 | 0.33 | 438.96 | -2.34 | -0.11 |
| W48D44 | | 423.39 | 10.75 | 0.58 | 436.60 | -4.71 | -0.23 |
| W6WJKU | | 410.80 | -1.84 | -0.10 | 426.80 | -14.50 | -0.70 |
| WPNU8T | | 390.00 | -22.64 | -1.22 | 429.80 | -11.50 | -0.56 |
| WRDR4Z | | 433.91 | 21.27 | 1.14 | 466.99 | 25.69 | 1.24 |
| WRQLHE | | 417.46 | 4.82 | 0.26 | 443.06 | 1.76 | 0.08 |
| WVCB2R | X | 403.14 | -9.50 | -0.51 | 479.78 | 38.48 | 1.86 |
| WWPVU3 | | 411.80 | -0.84 | -0.04 | 437.80 | -3.50 | -0.17 |
| X2H7J7 | | 418.98 | 6.34 | 0.34 | 440.46 | -0.84 | -0.04 |
| XP3GGV | | 425.00 | 12.37 | 0.67 | 458.01 | 16.70 | 0.81 |
| XXUUK2 | | 411.70 | -0.94 | -0.05 | 424.54 | -16.76 | -0.81 |
| YAK3HU | | 434.80 | 22.16 | 1.19 | 468.60 | 27.30 | 1.32 |
| YXALUX | | 412.40 | -0.24 | -0.01 | 436.00 | -5.30 | -0.26 |
| YZFTDP | | 420.80 | 8.16 | 0.44 | 452.80 | 11.50 | 0.55 |
| ZC78RC | | 422.32 | 9.68 | 0.52 | 449.94 | 8.64 | 0.42 |
| ZGY9UR | | 418.40 | 5.76 | 0.31 | 445.60 | 4.30 | 0.21 |
| ZM9KVX | | 409.00 | -3.64 | -0.20 | 446.80 | 5.50 | 0.27 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1323

Microhardness: Vickers Indenters (500 gf)
ASTM E384

Summary Statistics

| | <u>Sample S69</u> | | <u>Sample S70</u> | |
|--------------------------|-------------------|-----------|-------------------|-----------|
| Grand Means | 412.64 | HV 500 gf | 441.30 | HV 500 gf |
| Std Dev Btwn Labs | 18.59 | HV 500 gf | 20.72 | HV 500 gf |

Samples S69, S70 : Steel, Steel

Statistics based on 126 of 141 reporting participants

Comments on Assigned Data Flags for Test #1323

- 3FHP7Y (X) - Inconsistent in testing between samples.
- AB4GLM (X) - Inconsistent in testing between samples.
- BEFWKD (X) - Inconsistent in testing between samples.
- GTGE2E (X) - Extreme data.
- H4U36B (X) - Inconsistent in testing between samples.
- J8BMTC (X) - Inconsistent in testing between samples.
- KUZC2F (X) - Inconsistent in testing between samples.
- LVBV6A (X) - Inconsistent in testing between samples.
- MC9DPY (X) - Inconsistent in testing between samples.
- P7W9QB (X) - Inconsistent in testing between samples.
- QM6DY9 (X) - Data for sample S70 are low.
- QPNHN7 (X) - Extreme data.
- QT3ET8 (X) - Data for sample S69 are low.
- VM2NDX (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample S69.
- WVCB2R (X) - Inconsistent in testing between samples.

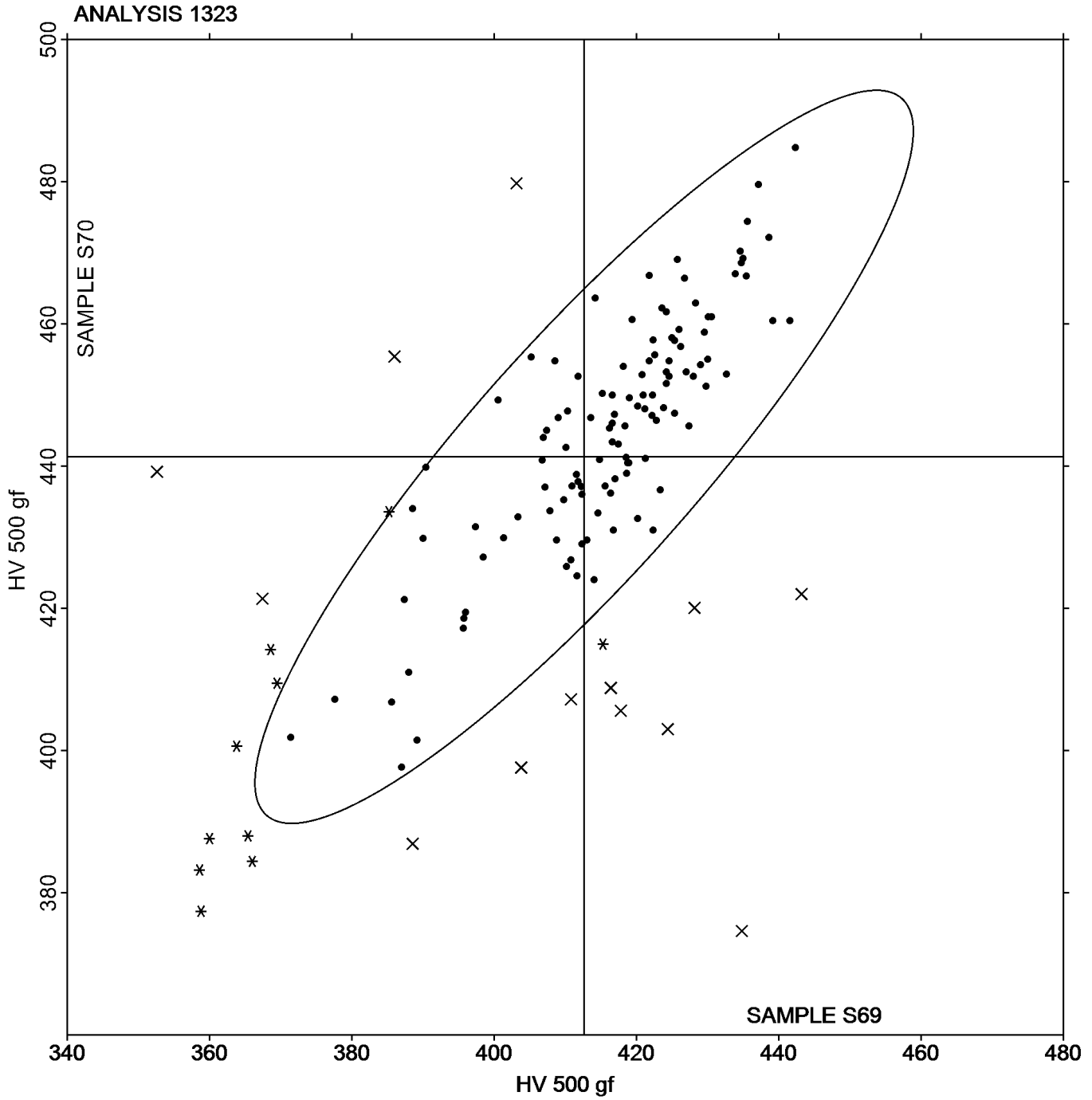


Analysis 1323

Microhardness: Vickers Indenters (500 gf)
ASTM E384

SAMPLE S69
412.64 HV 500 gf

SAMPLE S70
441.30 HV 500 gf





Fasteners and Metals Interlaboratory Testing Program
Analysis 1341
Brinell Hardness
ASTM E10

Cycle 131
3rd Qtr 2020

| WebCode | Data Flag | Sample D69 | | | Sample D70 | | |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| 27VDBL | | 321.56 | 2.44 | 0.46 | 368.78 | 0.08 | 0.01 |
| 2KJ9VT | | 320.00 | 0.88 | 0.16 | 363.00 | -5.70 | -0.75 |
| 3DC9RG | | 321.00 | 1.88 | 0.35 | 380.20 | 11.50 | 1.52 |
| 42FKDT | | 318.00 | -1.12 | -0.21 | 367.60 | -1.10 | -0.14 |
| 4434EQ | | 318.20 | -0.92 | -0.17 | 371.20 | 2.50 | 0.33 |
| 482FAQ | X | 316.64 | -2.48 | -0.46 | 346.99 | -21.71 | -2.87 |
| 4RRTNE | | 316.20 | -2.92 | -0.55 | 365.40 | -3.30 | -0.44 |
| 627CFP | | 315.00 | -4.12 | -0.77 | 359.00 | -9.70 | -1.28 |
| 629VJF | | 320.73 | 1.60 | 0.30 | 370.51 | 1.81 | 0.24 |
| 6T2ZPM | X | 197.02 | -122.10 | -22.85 | 228.74 | -139.96 | -18.49 |
| 9AVUQ3 | | 316.40 | -2.72 | -0.51 | 361.80 | -6.90 | -0.91 |
| 9DV7L3 | | 318.80 | -0.32 | -0.06 | 359.20 | -9.50 | -1.25 |
| 9E6BX7 | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| 9JKHL6 | | 321.00 | 1.88 | 0.35 | 375.00 | 6.30 | 0.83 |
| A9UGFF | | 308.00 | -11.12 | -2.08 | 361.60 | -7.10 | -0.94 |
| AKPP24 | | 319.00 | -0.12 | -0.02 | 369.60 | 0.90 | 0.12 |
| AT2PVE | | 323.00 | 3.88 | 0.73 | 378.40 | 9.70 | 1.28 |
| BFCA6K | * | 335.00 | 15.88 | 2.97 | 385.40 | 16.70 | 2.21 |
| BP4HXN | | 311.00 | -8.12 | -1.52 | 363.00 | -5.70 | -0.75 |
| CJMKXE | | 319.40 | 0.28 | 0.05 | 362.40 | -6.30 | -0.83 |
| CMBYLN | X | 290.00 | -29.12 | -5.45 | 337.20 | -31.50 | -4.16 |
| D482FX | | 313.00 | -6.12 | -1.15 | 365.40 | -3.30 | -0.44 |
| D8QVG6 | | 309.20 | -9.92 | -1.86 | 363.00 | -5.70 | -0.75 |
| DGHB7A | | 320.80 | 1.68 | 0.31 | 368.00 | -0.70 | -0.09 |
| DKGRGH | | 314.20 | -4.92 | -0.92 | 362.00 | -6.70 | -0.88 |
| EEQPWH | * | 332.86 | 13.74 | 2.57 | 379.94 | 11.24 | 1.49 |
| F862TZ | | 317.20 | -1.92 | -0.36 | 372.40 | 3.70 | 0.49 |
| F8JJUK | | 315.80 | -3.32 | -0.62 | 365.80 | -2.90 | -0.38 |
| F8KKDX | | 315.80 | -3.32 | -0.62 | 367.60 | -1.10 | -0.14 |
| FCCR7W | | 329.00 | 9.88 | 1.85 | 380.00 | 11.30 | 1.49 |
| FDP6YH | * | 306.00 | -13.12 | -2.46 | 346.00 | -22.70 | -3.00 |
| FHMLDW | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| G36CPX | | 320.40 | 1.28 | 0.24 | 367.00 | -1.70 | -0.22 |
| G6BQFC | | 321.00 | 1.88 | 0.35 | 367.00 | -1.70 | -0.22 |
| GMFXUE | | 323.40 | 4.28 | 0.80 | 378.00 | 9.30 | 1.23 |
| H7YQN8 | | 316.20 | -2.92 | -0.55 | 364.20 | -4.50 | -0.59 |
| HAL97T | | 321.00 | 1.88 | 0.35 | 375.00 | 6.30 | 0.83 |
| HJ86DK | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| HWUJ98 | | 318.60 | -0.52 | -0.10 | 373.80 | 5.10 | 0.67 |
| J4BEN3 | | 326.00 | 6.88 | 1.29 | 377.00 | 8.30 | 1.10 |
| JZ8J4D | | 320.14 | 1.02 | 0.19 | 368.62 | -0.08 | -0.01 |
| KJJRGJ | | 321.00 | 1.88 | 0.35 | 376.60 | 7.90 | 1.04 |
| KMWRFW | | 317.40 | -1.72 | -0.32 | 367.40 | -1.30 | -0.17 |
| KXYQN7 | | 321.00 | 1.88 | 0.35 | 382.80 | 14.10 | 1.86 |
| LYWBYC | | 311.00 | -8.12 | -1.52 | 363.00 | -5.70 | -0.75 |
| MLG3CA | | 320.40 | 1.28 | 0.24 | 364.40 | -4.30 | -0.57 |
| MVPJYA | | 323.36 | 4.24 | 0.79 | 379.62 | 10.92 | 1.44 |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1341

Brinell Hardness
ASTM E10

| WebCode | Data Flag | Sample D69 | | | Sample D70 | | |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV |
| MYL9FG | | 315.80 | -3.32 | -0.62 | 359.60 | -9.10 | -1.20 |
| NEBXTP | | 321.00 | 1.88 | 0.35 | 376.80 | 8.10 | 1.07 |
| NEQYT7 | | 318.20 | -0.92 | -0.17 | 362.20 | -6.50 | -0.86 |
| NJ6RQQ | | 321.00 | 1.88 | 0.35 | 366.60 | -2.10 | -0.28 |
| PRG2Z6 | | 316.60 | -2.52 | -0.47 | 372.00 | 3.30 | 0.44 |
| Q3QBQ2 | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| QRWPTJ | | 313.40 | -5.72 | -1.07 | 366.00 | -2.70 | -0.36 |
| QT3ET8 | | 322.86 | 3.74 | 0.70 | 382.52 | 13.82 | 1.83 |
| QXFXBN | | 315.00 | -4.12 | -0.77 | 372.20 | 3.50 | 0.46 |
| QYTP6Q | | 321.00 | 1.88 | 0.35 | 365.40 | -3.30 | -0.44 |
| R2Z4AB | * | 333.60 | 14.48 | 2.71 | 380.52 | 11.82 | 1.56 |
| R6APU3 | | 317.80 | -1.32 | -0.25 | 365.60 | -3.10 | -0.41 |
| RZKV83 | | 321.00 | 1.88 | 0.35 | 373.00 | 4.30 | 0.57 |
| T7QXM3 | | 327.20 | 8.08 | 1.51 | 382.40 | 13.70 | 1.81 |
| T8Z3ZR | | 317.92 | -1.20 | -0.23 | 371.06 | 2.36 | 0.31 |
| UXRLB7 | | 317.00 | -2.12 | -0.40 | 363.00 | -5.70 | -0.75 |
| V2L4JH | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| VU3W4Y | | 321.00 | 1.88 | 0.35 | 365.00 | -3.70 | -0.49 |
| VWVTQ8 | | 321.00 | 1.88 | 0.35 | 367.80 | -0.90 | -0.12 |
| W48D44 | | 314.80 | -4.32 | -0.81 | 364.00 | -4.70 | -0.62 |
| W4Q2LX | | 318.60 | -0.52 | -0.10 | 364.00 | -4.70 | -0.62 |
| WJKL9D | X | 340.20 | 21.08 | 3.94 | 384.80 | 16.10 | 2.13 |
| WPNM8M | | 326.80 | 7.68 | 1.44 | 381.00 | 12.30 | 1.63 |
| WPNU8T | | 307.40 | -11.72 | -2.19 | 354.00 | -14.70 | -1.94 |
| WRDR4Z | | 319.80 | 0.68 | 0.13 | 366.40 | -2.30 | -0.30 |
| X2H7J7 | | 325.00 | 5.88 | 1.10 | 365.00 | -3.70 | -0.49 |
| YXALUX | | 319.00 | -0.12 | -0.02 | 363.60 | -5.10 | -0.67 |
| YYQMXY | * | 306.20 | -12.92 | -2.42 | 360.60 | -8.10 | -1.07 |
| Z98QFH | | 318.40 | -0.72 | -0.14 | 372.40 | 3.70 | 0.49 |
| ZC78RC | | 321.00 | 1.88 | 0.35 | 363.00 | -5.70 | -0.75 |
| ZF7FWM | | 316.80 | -2.32 | -0.43 | 367.00 | -1.70 | -0.22 |
| ZFPY4F | * | 321.80 | 2.68 | 0.50 | 387.00 | 18.30 | 2.42 |
| ZGY9UR | | 322.20 | 3.08 | 0.58 | 370.00 | 1.30 | 0.17 |
| ZLVTZW | | 318.40 | -0.72 | -0.14 | 363.60 | -5.10 | -0.67 |
| ZM9KVX | | 312.40 | -6.72 | -1.26 | 368.80 | 0.10 | 0.01 |
| ZNMREU | | 318.80 | -0.32 | -0.06 | 373.20 | 4.50 | 0.60 |

Summary Statistics

| | Sample D69 | | Sample D70 | |
|--------------------------|------------|-----|------------|-----|
| Grand Means | 319.12 | HBW | 368.70 | HBW |
| Std Dev Btwn Labs | 5.34 | HBW | 7.57 | HBW |

Samples D69, D70 : Steel, Steel

Statistics based on 79 of 83 reporting participants

Samples D69, D70 are hardness test blocks made from steel. The blocks are heat treated to hardness levels specified by CTS.



Analysis 1341

**Brinell Hardness
ASTM E10**

Comments on Assigned Data Flags for Test #1341

482FAQ (X) - Data for sample D70 are low. Inconsistent within the determinations of both samples.

6T2ZPM (X) - Data for both samples are extremely low.

CMBYLN (X) - Data for both samples are low. Inconsistent within the determinations of sample D70.

WJKL9D (X) - Data for sample D69 are high.



Analysis 1341

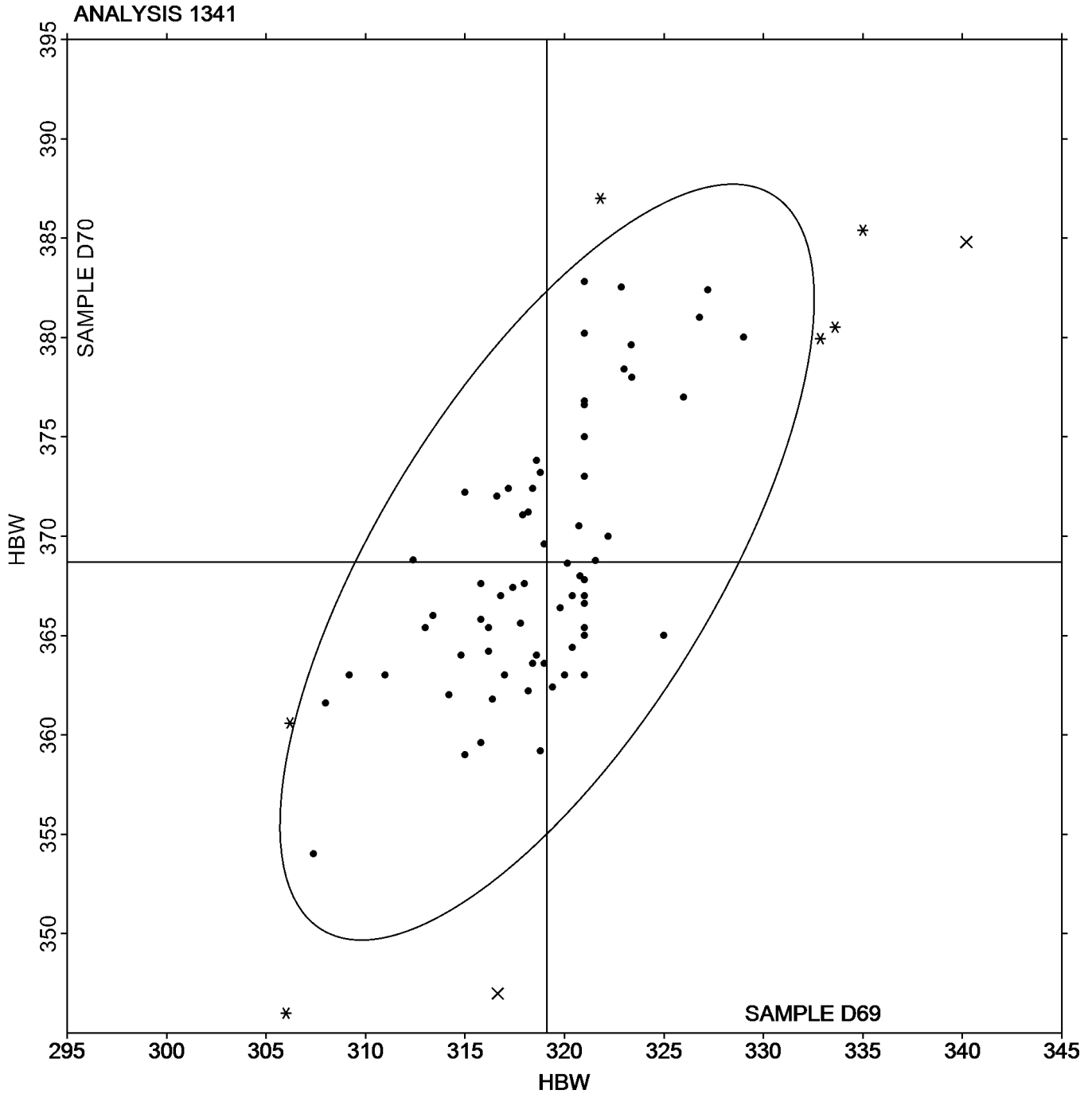
Brinell Hardness
ASTM E10

SAMPLE D69

319.12 HBW

SAMPLE D70

368.70 HBW





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1521

Titanium-based Alloy, HYDROGEN (H)
HYDROGEN (H)

Note: Analyses 1520 (Ti), 1522 (O), and 1523 (N) have been excluded from the report as too few participants reported data to form consensus statistics.

| WebCode | Data Flag | Sample T69 | | | Sample T70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 49ECDA | | 0.000800 | -0.00065 | -0.51 | 0.00590 | -0.00134 | -1.14 | CO |
| JTA42D | | 0.000933 | -0.00052 | -0.41 | 0.00700 | -0.00024 | -0.20 | IR |
| VU3W4Y | | 0.00337 | 0.00191 | 1.50 | 0.00730 | 0.00006 | 0.05 | CI |
| WRDR4Z | | 0.000710 | -0.00074 | -0.58 | 0.00877 | 0.00152 | 1.29 | CO |

Summary Statistics

| | Sample T69 | | Sample T70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 0.00145 | Percent | 0.00724 | Percent |
| Stnd Dev Btwn Labs | 0.00128 | Percent | 0.00118 | Percent |

Samples T69, T70 : Ti 6-4 (Gr. 5), Ti 6-4 (Gr. 5)

Statistics based on 4 of 4 reporting participants

Key to Method Codes Reported by Participants

- CI Combustion / IR
- IR IR (Absorption / Detection)
- CO Combustion

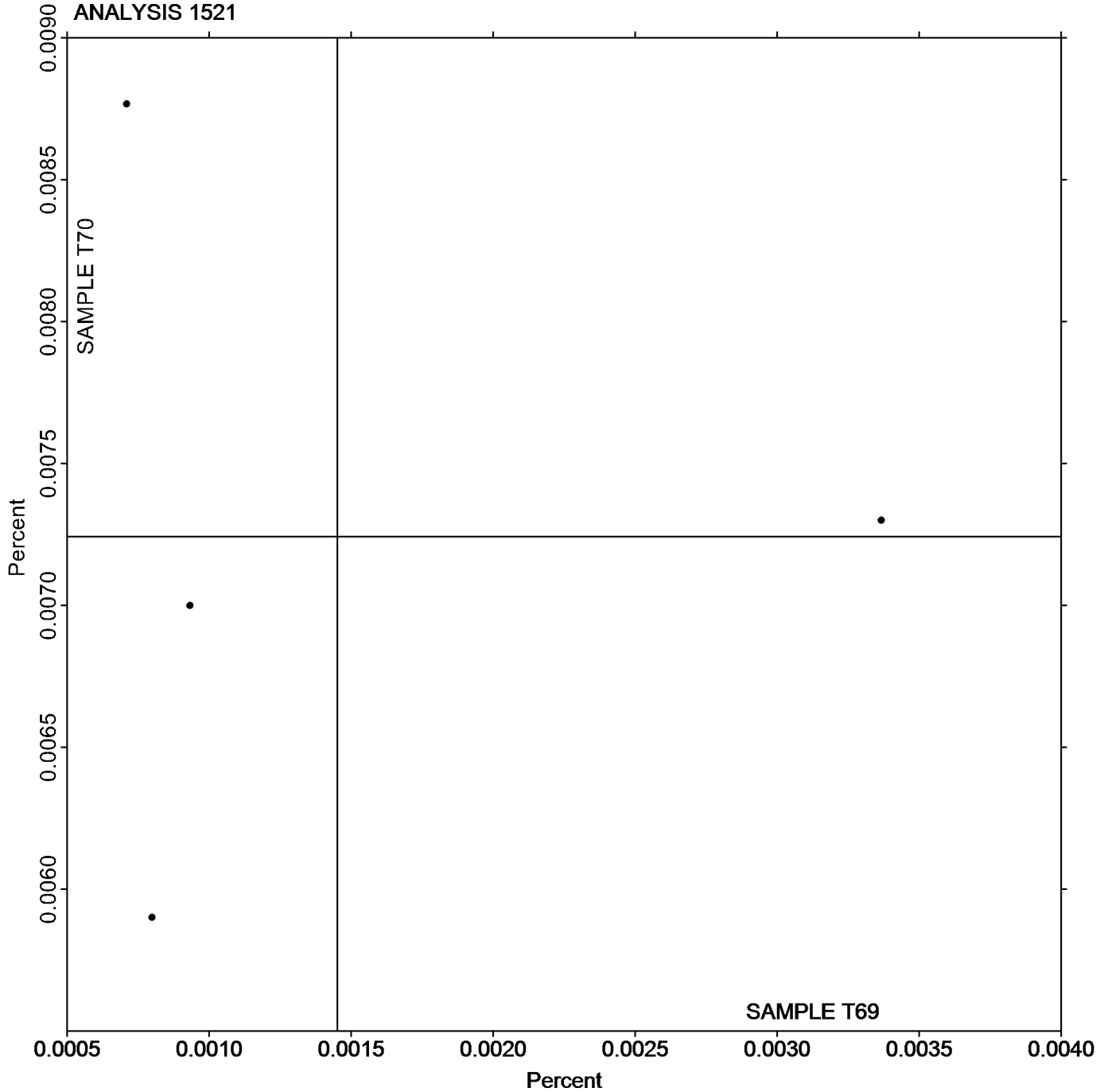


Analysis 1521

Titanium-based Alloy, HYDROGEN (H)
HYDROGEN (H)

SAMPLE T69
0.00145 Percent

SAMPLE T70
0.00724 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1524

Titanium-based Alloy, ALUMINUM (Al)
ALUMINUM (Al)

Note: Analyses 1520 (Ti), 1522 (O), and 1523 (N) have been excluded from the report as too few participants reported data to form consensus statistics.

| WebCode | Data Flag | Sample T69 | | | Sample T70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| TTKV8Z | | 6.517 | 0.018 | 0.47 | 6.214 | -0.005 | -0.19 | OE |
| VU3W4Y | | 6.445 | -0.055 | -1.47 | 6.190 | -0.029 | -1.15 | IC |
| WRDR4Z | | 6.510 | 0.010 | 0.27 | 6.220 | 0.002 | 0.06 | XR |
| YZHQKE | | 6.527 | 0.027 | 0.73 | 6.250 | 0.032 | 1.28 | OE |

Summary Statistics

| | Sample T69 | | Sample T70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 6.500 | Percent | 6.218 | Percent |
| Stnd Dev Btwn Labs | 0.037 | Percent | 0.025 | Percent |

Samples T69, T70 : Ti 6-4 (Gr. 5), Ti 6-4 (Gr. 5)

Statistics based on 4 of 4 reporting participants

Key to Method Codes Reported by Participants

- IC Spectrometry - Inductively Coupled Plasma (ICP)
- OE Spectrometry - Optical Emission (OES)
- XR X-Ray Fluorescence - ED or WD not specified



Analysis 1524

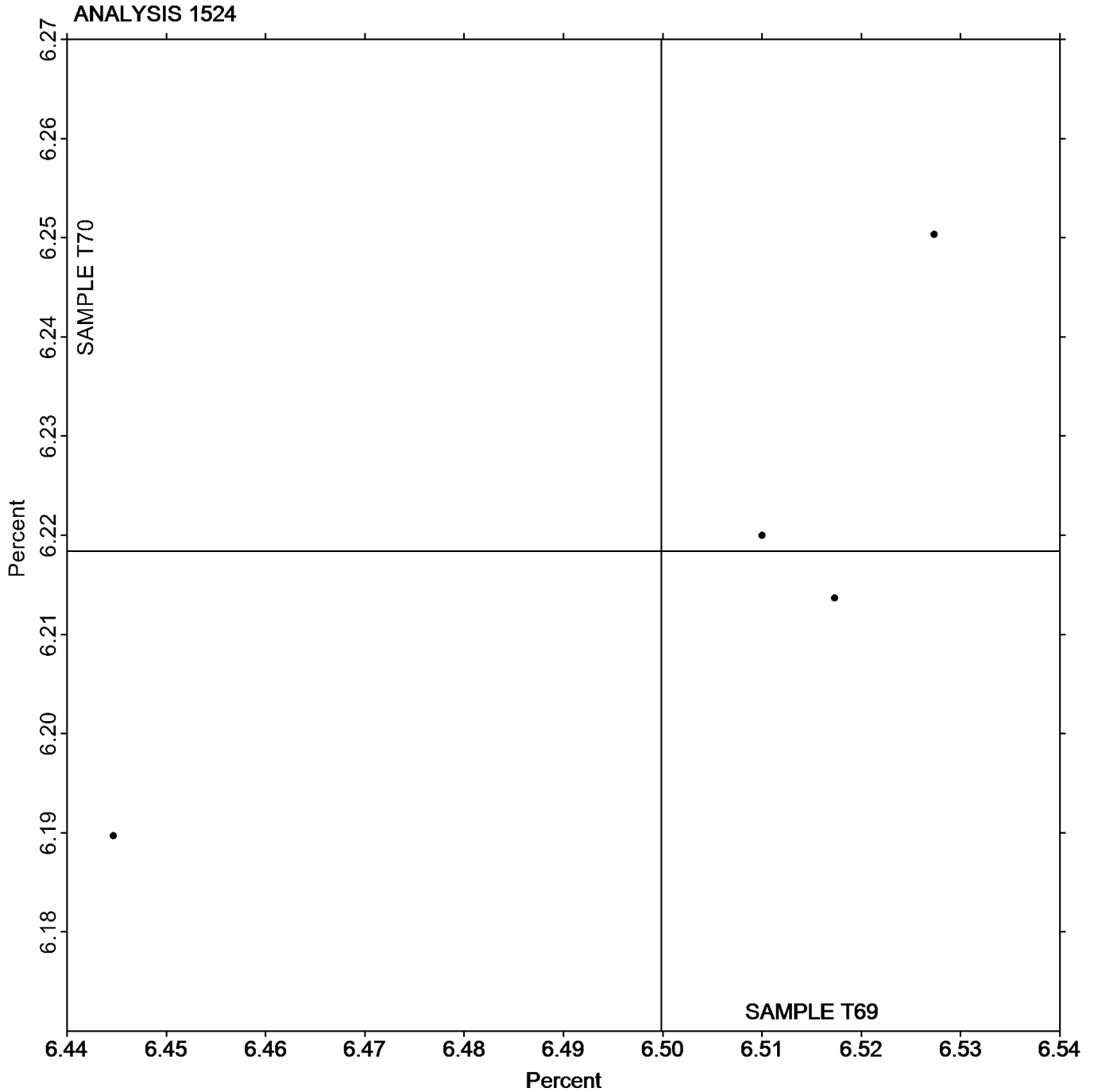
Titanium-based Alloy, ALUMINUM (Al)
ALUMINUM (Al)

SAMPLE T69

6.500 Percent

SAMPLE T70

6.218 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1525

Titanium-based Alloy, VANADIUM (V)
VANADIUM (V)

Note: Analyses 1520 (Ti), 1522 (O), and 1523 (N) have been excluded from the report as too few participants reported data to form consensus statistics.

| WebCode | Data Flag | Sample T69 | | | Sample T70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| TTKV8Z | | 4.203 | 0.005 | 0.07 | 4.008 | -0.018 | -0.32 | OE |
| VU3W4Y | | 4.292 | 0.094 | 1.26 | 4.009 | -0.018 | -0.32 | IC |
| WRDR4Z | | 4.110 | -0.088 | -1.18 | 3.980 | -0.047 | -0.82 | XR |
| YZHQKE | | 4.186 | -0.012 | -0.15 | 4.109 | 0.083 | 1.46 | OE |

Summary Statistics

| | Sample T69 | | Sample T70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 4.198 | Percent | 4.027 | Percent |
| Stnd Dev Btwn Labs | 0.075 | Percent | 0.057 | Percent |

Samples T69, T70 : Ti 6-4 (Gr. 5), Ti 6-4 (Gr. 5)

Statistics based on 4 of 4 reporting participants

Key to Method Codes Reported by Participants

- IC Spectrometry - Inductively Coupled Plasma (ICP)
- OE Spectrometry - Optical Emission (OES)
- XR X-Ray Fluorescence - ED or WD not specified



Analysis 1525

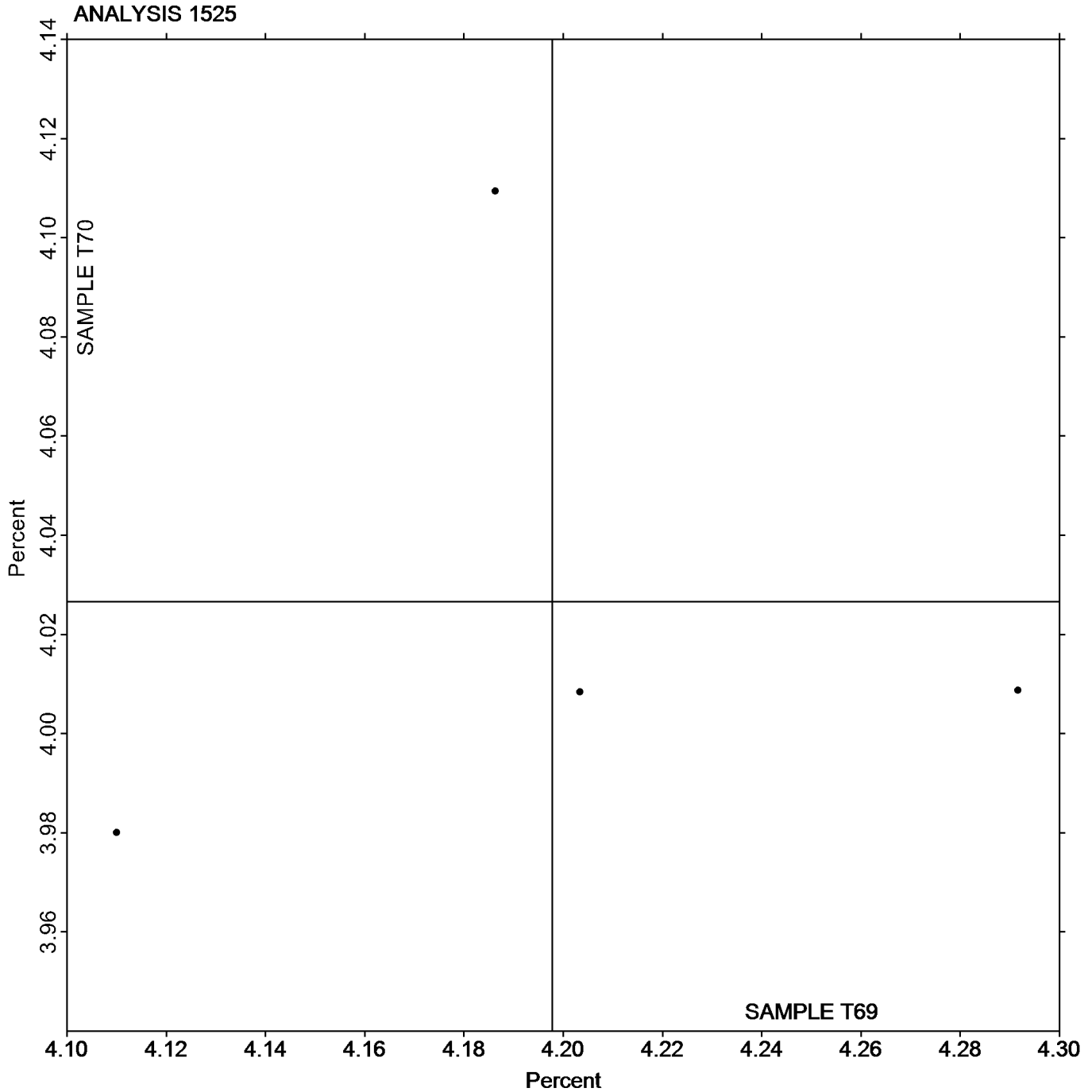
Titanium-based Alloy, VANADIUM (V)
VANADIUM (V)

SAMPLE T69

4.198 Percent

SAMPLE T70

4.027 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1526

Titanium-based Alloy, IRON (Fe)
IRON (Fe)

Note: Analyses 1520 (Ti), 1522 (O), and 1523 (N) have been excluded from the report as too few participants reported data to form consensus statistics.

| WebCode | Data Flag | Sample T69 | | | Sample T70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| TTKV8Z | | 0.2077 | 0.0086 | 1.15 | 0.1473 | -0.0028 | -0.13 | OE |
| VU3W4Y | | 0.1927 | -0.0064 | -0.86 | 0.1350 | -0.0152 | -0.71 | IC |
| WRDR4Z | | 0.1930 | -0.0061 | -0.81 | 0.1810 | 0.0308 | 1.45 | XR |
| YZHQKE | | 0.2030 | 0.0039 | 0.52 | 0.1373 | -0.0128 | -0.60 | OE |

Summary Statistics

| | Sample T69 | | Sample T70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 0.1991 | Percent | 0.1502 | Percent |
| Stnd Dev Btwn Labs | 0.0075 | Percent | 0.0212 | Percent |

Samples T69, T70 : Ti 6-4 (Gr. 5), Ti 6-4 (Gr. 5)

Statistics based on 4 of 4 reporting participants

Key to Method Codes Reported by Participants

IC Spectrometry - Inductively Coupled Plasma (ICP) OE Spectrometry - Optical Emission (OES)
 XR X-Ray Fluorescence - ED or WD not specified

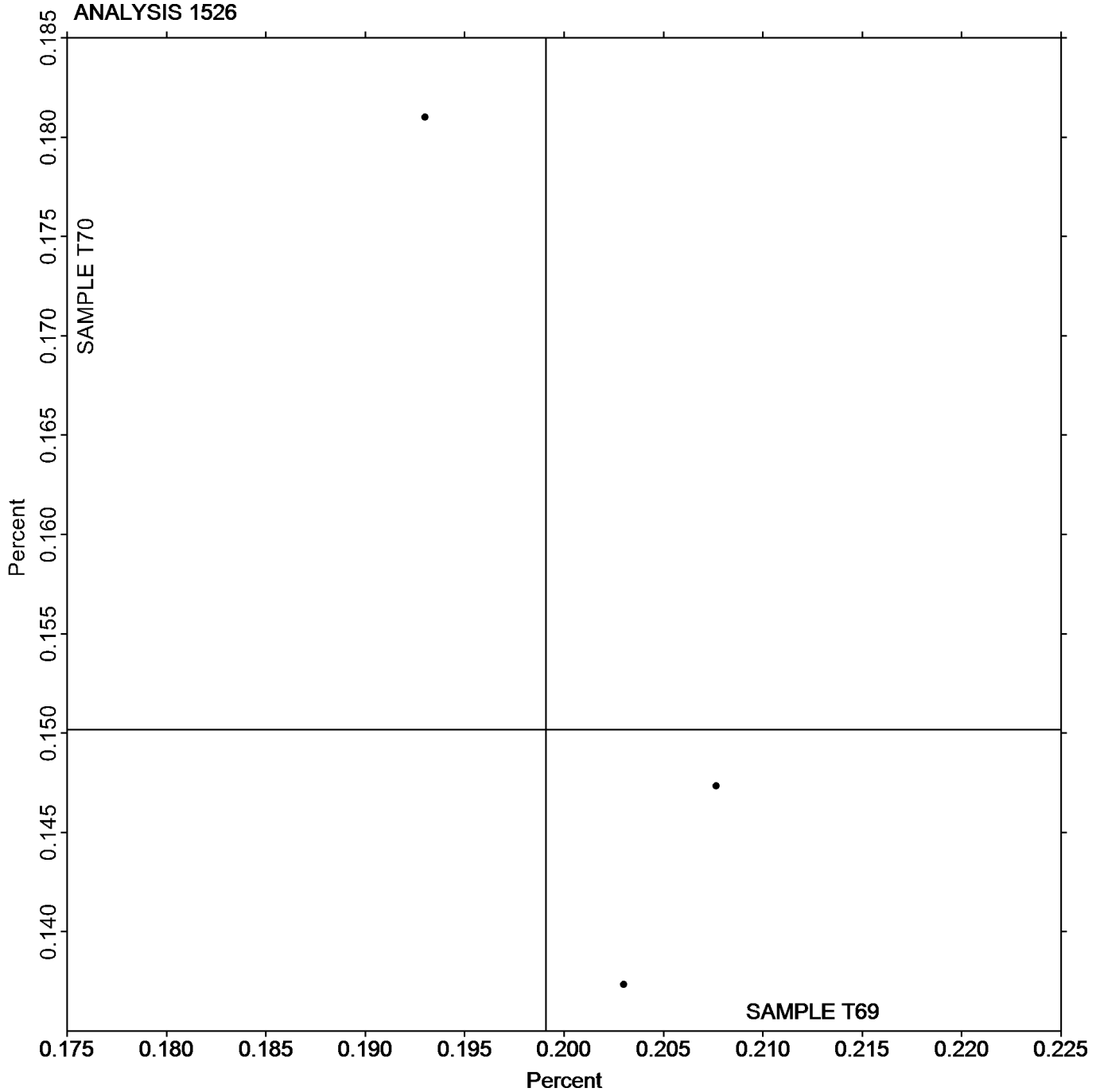


Analysis 1526

Titanium-based Alloy, IRON (Fe)
IRON (Fe)

SAMPLE T69
0.1991 Percent

SAMPLE T70
0.1502 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1527

Titanium-based Alloy, CARBON (C)
CARBON (C)

Note: Analyses 1520 (Ti), 1522 (O), and 1523 (N) have been excluded from the report as too few participants reported data to form consensus statistics.

| WebCode | Data Flag | Sample T69 | | | Sample T70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| TTKV8Z | | 0.0172 | -0.0141 | -0.83 | 0.0165 | 0.0029 | 0.92 | OE |
| VU3W4Y | | 0.0500 | 0.0187 | 1.11 | 0.0140 | 0.0005 | 0.15 | CI |
| WRDR4Z | | 0.0266 | -0.0047 | -0.28 | 0.0101 | -0.0034 | -1.07 | CO |

Summary Statistics

| | Sample T69 | | Sample T70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 0.0313 | Percent | 0.0135 | Percent |
| Stnd Dev Btwn Labs | 0.0169 | Percent | 0.0032 | Percent |

Samples T69, T70 : Ti 6-4 (Gr. 5), Ti 6-4 (Gr. 5)

Statistics based on 3 of 3 reporting participants

Key to Method Codes Reported by Participants

- CI Combustion / IR
- CO Combustion
- OE Spectrometry - Optical Emission (OES)

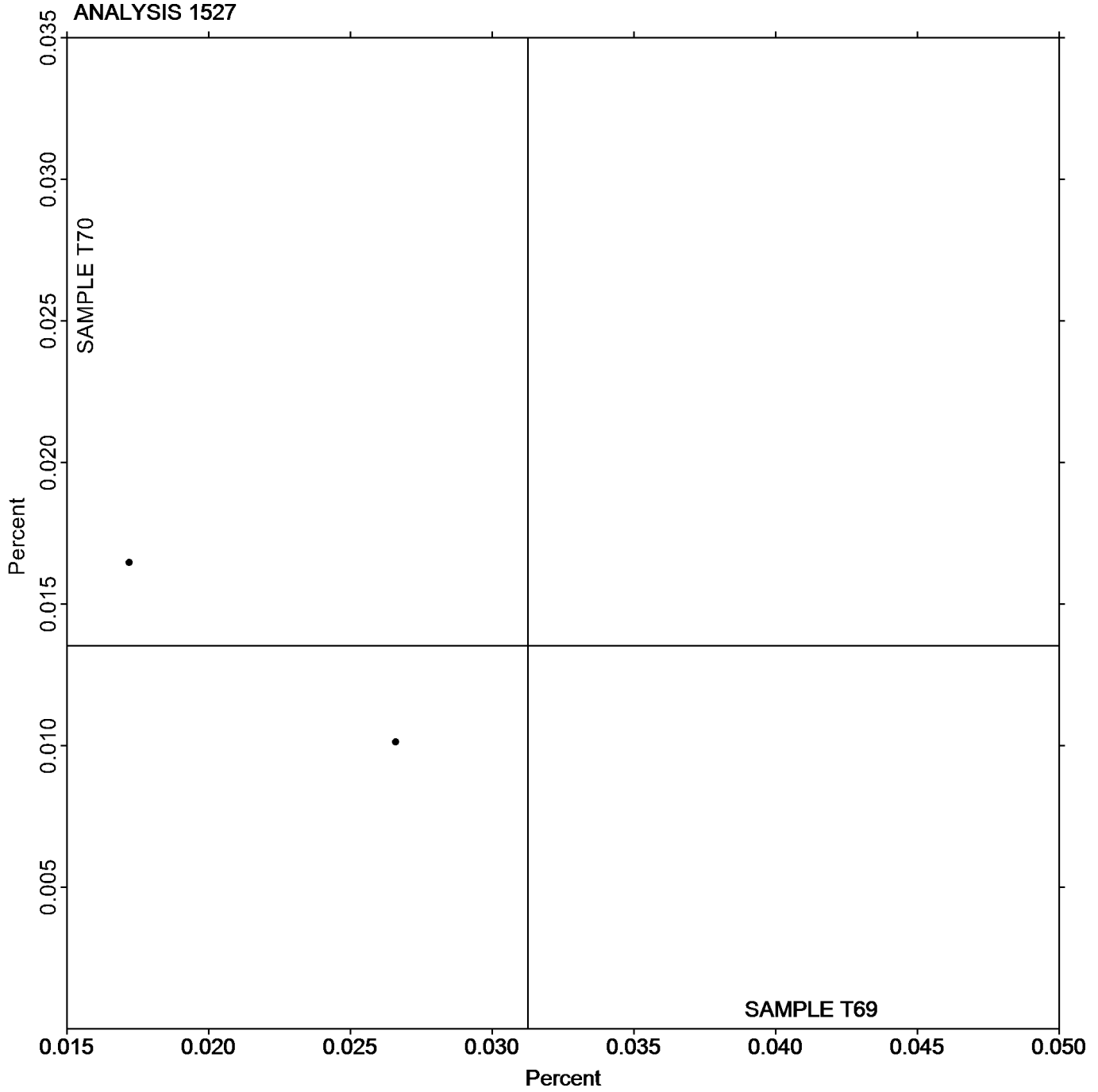


Analysis 1527

Titanium-based Alloy, CARBON (C)
CARBON (C)

SAMPLE T69
0.0313 Percent

SAMPLE T70
0.0135 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1600

Carbon & Low Alloy Steel, CARBON (C)
CARBON (C)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | X | 0.4267 | -0.0385 | -4.85 | 0.4503 | -0.0392 | -4.51 | OE |
| 2GKXZT | * | 0.4773 | 0.0121 | 1.52 | 0.4883 | -0.0012 | -0.13 | OE |
| 2HRC8Y | X | 0.4913 | 0.0261 | 3.28 | 0.4987 | 0.0092 | 1.05 | GD |
| 2J6V3P | | 0.4600 | -0.0052 | -0.66 | 0.4877 | -0.0018 | -0.21 | OE |
| 2KE2HY | X | 0.4300 | -0.0352 | -4.43 | 0.4500 | -0.0395 | -4.54 | OE |
| 2KJ9VT | | 0.4787 | 0.0134 | 1.69 | 0.5090 | 0.0195 | 2.24 | OE |
| 2M68YP | | 0.4602 | -0.0051 | -0.64 | 0.4800 | -0.0095 | -1.09 | OE |
| 3JHXDV | | 0.4674 | 0.0021 | 0.27 | 0.4875 | -0.0020 | -0.23 | OE |
| 3KDPZ2 | | 0.4667 | 0.0015 | 0.18 | 0.4923 | 0.0028 | 0.32 | CI |
| 3RC47W | X | 0.4733 | 0.0081 | 1.02 | 0.5113 | 0.0218 | 2.51 | OE |
| 4434EQ | | 0.4600 | -0.0052 | -0.66 | 0.4830 | -0.0065 | -0.75 | OE |
| 46C9RE | | 0.4650 | -0.0002 | -0.03 | 0.4903 | 0.0008 | 0.10 | OE |
| 4CDPZY | | 0.4627 | -0.0026 | -0.32 | 0.4808 | -0.0087 | -1.00 | OE |
| 4XEJBA | X | 0.4923 | 0.0271 | 3.41 | 0.5113 | 0.0218 | 2.51 | OE |
| 4YBU7D | | 0.4847 | 0.0194 | 2.45 | 0.5100 | 0.0205 | 2.36 | OE |
| 629VJF | | 0.4777 | 0.0124 | 1.56 | 0.5073 | 0.0178 | 2.05 | OE |
| 6MPCPQ | | 0.4555 | -0.0097 | -1.23 | 0.4762 | -0.0133 | -1.53 | XX |
| 73XQG8 | X | 0.4482 | -0.0170 | -2.14 | 0.5169 | 0.0274 | 3.15 | CI |
| 7LFM28 | X | 0.4562 | -0.0090 | -1.13 | 0.4692 | -0.0203 | -2.34 | AE |
| 7Q4AR7 | | 0.4683 | 0.0031 | 0.39 | 0.4980 | 0.0085 | 0.98 | OE |
| 7WUJ36 | | 0.4727 | 0.0075 | 0.94 | 0.4960 | 0.0065 | 0.75 | OE |
| 86HURQ | | 0.4653 | 0.0001 | 0.01 | 0.4831 | -0.0064 | -0.74 | CI |
| 8G3ZAN | X | 0.4383 | -0.0269 | -3.39 | 0.4733 | -0.0162 | -1.86 | OE |
| 962X2C | X | 0.4887 | 0.0234 | 2.95 | 0.5050 | 0.0155 | 1.78 | OE |
| 99VYYK | | 0.4773 | 0.0120 | 1.51 | 0.4951 | 0.0056 | 0.64 | CI |
| 9DV7L3 | | 0.4564 | -0.0088 | -1.11 | 0.4827 | -0.0068 | -0.78 | XX |
| 9GUGFH | | 0.4669 | 0.0017 | 0.21 | 0.4902 | 0.0007 | 0.08 | OE |
| 9JKHL6 | | 0.4647 | -0.0006 | -0.07 | 0.4900 | 0.0005 | 0.06 | CO |
| 9L4TGN | | 0.4703 | 0.0051 | 0.64 | 0.4973 | 0.0078 | 0.90 | CO |
| 9NU2FR | | 0.4820 | 0.0168 | 2.11 | 0.5093 | 0.0198 | 2.28 | CI |
| 9RB4R4 | | 0.4677 | 0.0024 | 0.31 | 0.4890 | -0.0005 | -0.06 | CI |
| 9UL26L | | 0.4600 | -0.0052 | -0.66 | 0.4830 | -0.0065 | -0.75 | AE |
| A2XP8L | | 0.4623 | -0.0029 | -0.37 | 0.4830 | -0.0065 | -0.75 | AE |
| C3YA9Q | | 0.4693 | 0.0041 | 0.52 | 0.4957 | 0.0062 | 0.71 | CI |
| C3YELE | X | 0.4343 | -0.0309 | -3.89 | 0.4820 | -0.0075 | -0.86 | CI |
| CBD7YJ | | 0.4600 | -0.0052 | -0.66 | 0.4887 | -0.0008 | -0.10 | CI |
| CEA2FX | | 0.4613 | -0.0040 | -0.50 | 0.4893 | -0.0002 | -0.02 | CO |
| CEYZUY | | 0.4667 | 0.0014 | 0.18 | 0.5000 | 0.0105 | 1.21 | OE |
| CGY9X9 | | 0.4699 | 0.0047 | 0.59 | 0.4942 | 0.0047 | 0.54 | OE |
| CHXDE3 | | 0.4667 | 0.0014 | 0.18 | 0.4890 | -0.0005 | -0.06 | OE |
| CTVAJP | | 0.4583 | -0.0069 | -0.87 | 0.4803 | -0.0092 | -1.05 | OE |
| CU8QW4 | | 0.4600 | -0.0052 | -0.66 | 0.4787 | -0.0108 | -1.25 | GD |
| D7E2XY | X | 0.4510 | -0.0142 | -1.79 | 0.4493 | -0.0402 | -4.62 | OE |
| D7YZUW | | 0.4610 | -0.0042 | -0.53 | 0.4857 | -0.0038 | -0.44 | OE |
| D9N7C9 | X | 0.4356 | -0.0297 | -3.73 | 0.4691 | -0.0204 | -2.35 | OE |
| DGHB7A | | 0.4547 | -0.0106 | -1.33 | 0.4873 | -0.0022 | -0.25 | CO |
| DH7RFG | | 0.4473 | -0.0179 | -2.25 | 0.4750 | -0.0145 | -1.67 | IR |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1600

Carbon & Low Alloy Steel, CARBON (C)
CARBON (C)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | | 0.4488 | -0.0164 | -2.07 | 0.4679 | -0.0216 | -2.49 | OE |
| DKGRGH | | 0.4643 | -0.0009 | -0.11 | 0.4920 | 0.0025 | 0.29 | CO |
| DLALF8 | | 0.4680 | 0.0028 | 0.35 | 0.4940 | 0.0045 | 0.52 | OE |
| DNF4E3 | | 0.4743 | 0.0091 | 1.14 | 0.4947 | 0.0052 | 0.59 | OE |
| DT9842 | X | 0.4737 | 0.0084 | 1.06 | 0.4457 | -0.0438 | -5.04 | OE |
| DWVPLL | | 0.4640 | -0.0012 | -0.16 | 0.4960 | 0.0065 | 0.75 | CI |
| EK984Y | | 0.4597 | -0.0056 | -0.70 | 0.4813 | -0.0082 | -0.94 | OE |
| EYTPYN | | 0.4705 | 0.0053 | 0.66 | 0.4916 | 0.0021 | 0.24 | OE |
| F6GPUU | | 0.4698 | 0.0045 | 0.57 | 0.4894 | -0.0001 | -0.02 | OE |
| F7QPWG | | 0.4567 | -0.0086 | -1.08 | 0.4800 | -0.0095 | -1.09 | GD |
| F8HXWJ | | 0.4729 | 0.0077 | 0.96 | 0.4977 | 0.0082 | 0.94 | OE |
| FA84EV | | 0.4667 | 0.0014 | 0.18 | 0.4957 | 0.0062 | 0.71 | OE |
| FCCRW7 | | 0.4673 | 0.0021 | 0.26 | 0.4938 | 0.0043 | 0.49 | OE |
| FEZ4VC | | 0.4720 | 0.0068 | 0.85 | 0.4970 | 0.0075 | 0.86 | OE |
| FFVMWD | | 0.4660 | 0.0008 | 0.10 | 0.4880 | -0.0015 | -0.17 | OE |
| FPMXBE | | 0.4622 | -0.0030 | -0.38 | 0.4802 | -0.0093 | -1.07 | OE |
| FRALME | * | 0.4432 | -0.0221 | -2.78 | 0.4704 | -0.0191 | -2.20 | CI |
| FTHWGX | X | 0.5021 | 0.0369 | 4.64 | 0.5295 | 0.0400 | 4.60 | OE |
| G4JUQJ | | 0.4783 | 0.0131 | 1.65 | 0.5003 | 0.0108 | 1.25 | AE |
| GY7VD4 | | 0.4667 | 0.0014 | 0.18 | 0.4933 | 0.0038 | 0.44 | CI |
| H7K4CK | | 0.4660 | 0.0008 | 0.10 | 0.4890 | -0.0005 | -0.06 | OE |
| HBFPNG | | 0.4600 | -0.0052 | -0.66 | 0.4867 | -0.0028 | -0.33 | OE |
| HHEK2L | | 0.4657 | 0.0004 | 0.05 | 0.4870 | -0.0025 | -0.29 | CI |
| HJ4QGC | | 0.4659 | 0.0007 | 0.08 | 0.4948 | 0.0053 | 0.61 | OE |
| HRF2TC | * | 0.4423 | -0.0229 | -2.88 | 0.4627 | -0.0268 | -3.09 | OE |
| J3FQAD | | 0.4543 | -0.0109 | -1.37 | 0.4783 | -0.0112 | -1.28 | OE |
| J4BEN3 | | 0.4453 | -0.0199 | -2.50 | 0.4737 | -0.0158 | -1.82 | OE |
| J94HFK | | 0.4617 | -0.0036 | -0.45 | 0.4870 | -0.0025 | -0.29 | OE |
| JVFECV | | 0.4836 | 0.0183 | 2.31 | 0.5096 | 0.0201 | 2.31 | OE |
| K3TPYU | | 0.4684 | 0.0032 | 0.40 | 0.4872 | -0.0023 | -0.26 | OE |
| K4P697 | | 0.4773 | 0.0121 | 1.52 | 0.5000 | 0.0105 | 1.21 | OE |
| KJMALA | | 0.4743 | 0.0091 | 1.14 | 0.4990 | 0.0095 | 1.09 | OE |
| KNT624 | | 0.4560 | -0.0092 | -1.16 | 0.4793 | -0.0102 | -1.17 | OE |
| LCKF89 | | 0.4720 | 0.0068 | 0.85 | 0.4980 | 0.0085 | 0.98 | XX |
| LHLYY7 | | 0.4623 | -0.0029 | -0.37 | 0.4887 | -0.0008 | -0.10 | OE |
| LYWBYC | | 0.4653 | 0.0001 | 0.01 | 0.4877 | -0.0018 | -0.21 | OE |
| MTXLKC | | 0.4672 | 0.0019 | 0.24 | 0.4941 | 0.0046 | 0.53 | IR |
| MYL9FG | | 0.4547 | -0.0106 | -1.33 | 0.4797 | -0.0098 | -1.13 | OE |
| NDG3C9 | | 0.4680 | 0.0028 | 0.35 | 0.4917 | 0.0022 | 0.25 | CI |
| NEBXTTP | | 0.4696 | 0.0044 | 0.55 | 0.4933 | 0.0038 | 0.44 | XX |
| NGYARV | | 0.4598 | -0.0054 | -0.68 | 0.4820 | -0.0075 | -0.87 | DR |
| NJ6RQQ | | 0.4657 | 0.0004 | 0.05 | 0.4823 | -0.0072 | -0.82 | OE |
| NNKXVD | X | 0.4953 | 0.0301 | 3.79 | 0.5265 | 0.0370 | 4.25 | OE |
| NPC426 | | 0.4643 | -0.0009 | -0.11 | 0.4910 | 0.0015 | 0.17 | OE |
| NRJAQD | | 0.4650 | -0.0002 | -0.03 | 0.4907 | 0.0012 | 0.13 | OE |
| P2PLEU | | 0.4653 | 0.0000 | 0.00 | 0.4874 | -0.0021 | -0.24 | OE |
| P4QQRE | | 0.4653 | 0.0001 | 0.01 | 0.4950 | 0.0055 | 0.63 | CI |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1600

Carbon & Low Alloy Steel, CARBON (C)
CARBON (C)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| P7ZW8N | X | 0.4642 | -0.0010 | -0.13 | 0.4715 | -0.0180 | -2.07 | OE |
| PBUNLD | | 0.4590 | -0.0062 | -0.78 | 0.4810 | -0.0085 | -0.98 | OE |
| PDLKB8 | | 0.4657 | 0.0004 | 0.05 | 0.4880 | -0.0015 | -0.17 | OE |
| PQ4G6A | | 0.4676 | 0.0024 | 0.30 | 0.4913 | 0.0018 | 0.21 | OE |
| PQJZP8 | | 0.4657 | 0.0004 | 0.05 | 0.4903 | 0.0008 | 0.10 | CI |
| PRX8BN | | 0.4698 | 0.0046 | 0.57 | 0.4965 | 0.0070 | 0.80 | OE |
| Q9GFPX | | 0.4720 | 0.0068 | 0.85 | 0.4983 | 0.0088 | 1.02 | CI |
| QRWPTJ | | 0.4650 | -0.0002 | -0.03 | 0.4873 | -0.0022 | -0.25 | GD |
| QT3ET8 | | 0.4710 | 0.0058 | 0.73 | 0.4960 | 0.0065 | 0.75 | GD |
| R8F3HV | | 0.4650 | -0.0002 | -0.03 | 0.4963 | 0.0068 | 0.79 | CI |
| RA9VEZ | | 0.4670 | 0.0018 | 0.22 | 0.4920 | 0.0025 | 0.29 | OE |
| RHNHN4 | | 0.4744 | 0.0091 | 1.15 | 0.4983 | 0.0088 | 1.01 | OE |
| RZJ8HC | X | 0.4904 | 0.0251 | 3.16 | 0.4678 | -0.0217 | -2.50 | CI |
| T7QXM3 | | 0.4720 | 0.0068 | 0.86 | 0.4999 | 0.0104 | 1.20 | OE |
| T8Z3ZR | | 0.4637 | -0.0015 | -0.19 | 0.4857 | -0.0038 | -0.44 | CI |
| TZJHYZ | | 0.4587 | -0.0066 | -0.83 | 0.4833 | -0.0062 | -0.71 | OE |
| U3LRHG | | 0.4580 | -0.0072 | -0.91 | 0.4790 | -0.0105 | -1.21 | OE |
| UN4W8R | | 0.4674 | 0.0021 | 0.27 | 0.4962 | 0.0067 | 0.77 | CI |
| UPDZ23 | * | 0.4747 | 0.0094 | 1.19 | 0.4867 | -0.0028 | -0.32 | OE |
| V4BFHN | | 0.4503 | -0.0149 | -1.88 | 0.4757 | -0.0138 | -1.59 | XX |
| VDCZHV | | 0.4563 | -0.0089 | -1.12 | 0.4810 | -0.0085 | -0.98 | CI |
| VM2NDX | X | 0.4930 | 0.0278 | 3.49 | 0.5210 | 0.0315 | 3.62 | OE |
| VU3W4Y | | 0.4710 | 0.0058 | 0.73 | 0.4877 | -0.0018 | -0.21 | OE |
| VU6QHx | | 0.4669 | 0.0017 | 0.21 | 0.4892 | -0.0003 | -0.04 | OE |
| VWVTQ8 | | 0.4700 | 0.0048 | 0.60 | 0.4913 | 0.0018 | 0.21 | CI |
| VYXQ2Z | | 0.4603 | -0.0049 | -0.62 | 0.4867 | -0.0028 | -0.33 | CO |
| W9XMCG | | 0.4663 | 0.0011 | 0.14 | 0.4927 | 0.0032 | 0.36 | CI |
| WB4822 | | 0.4744 | 0.0091 | 1.15 | 0.4983 | 0.0088 | 1.02 | CI |
| WPNM8M | | 0.4713 | 0.0061 | 0.77 | 0.4977 | 0.0082 | 0.94 | XX |
| WRDR4Z | | 0.4770 | 0.0118 | 1.48 | 0.5017 | 0.0122 | 1.40 | OE |
| WVEXGK | | 0.4619 | -0.0033 | -0.42 | 0.4873 | -0.0022 | -0.25 | IR |
| X366CV | | 0.4645 | -0.0007 | -0.09 | 0.4862 | -0.0033 | -0.38 | OE |
| XL29E7 | | 0.4573 | -0.0079 | -0.99 | 0.4767 | -0.0128 | -1.48 | OE |
| YDNUV2 | X | 0.4390 | -0.0262 | -3.30 | 0.4773 | -0.0122 | -1.40 | CI |
| YHF7LQ | | 0.4717 | 0.0064 | 0.81 | 0.4927 | 0.0032 | 0.36 | DR |
| YPJTYZ | | 0.4600 | -0.0052 | -0.66 | 0.4827 | -0.0068 | -0.79 | OE |
| YQURVU | | 0.4617 | -0.0036 | -0.45 | 0.4900 | 0.0005 | 0.06 | CO |
| YZFTDP | | 0.4557 | -0.0096 | -1.20 | 0.4803 | -0.0092 | -1.05 | IC |
| ZC78RC | X | 0.4853 | 0.0201 | 2.53 | 0.5193 | 0.0298 | 3.43 | GD |
| ZD2N8V | | 0.4848 | 0.0196 | 2.46 | 0.5056 | 0.0161 | 1.85 | OE |
| ZM9KVX | | 0.4640 | -0.0012 | -0.16 | 0.4870 | -0.0025 | -0.29 | OE |
| ZRKBCL | X | 0.4255 | -0.0398 | -5.00 | 0.4382 | -0.0513 | -5.90 | OE |
| ZYLHZ3 | X | 0.4413 | -0.0239 | -3.01 | 0.5017 | 0.0122 | 1.40 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1600

Carbon & Low Alloy Steel, CARBON (C)
CARBON (C)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.4652 | Percent | 0.4895 | Percent |
| Std Dev Btwn Labs | 0.0079 | Percent | 0.0087 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 113 of 137 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1600

- 2AWLDB (X) - Data for both samples are low. Possible Systematic Error. Inconsistent within the determinations of sample L69.
- 2HRC8Y (X) - Data for sample L69 are high.
- 2KE2HY (X) - Data for both samples are low. Possible Systematic Error.
- 3RC47W (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- 4XEJBA (X) - Data for sample L69 are high.
- 73XQG8 (X) - Data for sample L70 are high.
- 7LFM28 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L70.
- 8G3ZAN (X) - Data for sample L69 are low. Inconsistent within the determinations of sample L70.
- 962X2C (X) - Data for sample L69 are high. Inconsistent within the determinations of sample L70.
- C3YELE (X) - Data for sample L69 are low. Inconsistent within the determinations of sample L70.
- D7E2XY (X) - Data for sample L70 are low.
- D9N7C9 (X) - Data for sample L69 are low.
- DT9842 (X) - Data for sample L70 are low.
- FTHWGX (X) - Data for both samples are high. Possible Systematic Error.
- NNKXVD (X) - Data for both samples are high. Possible Systematic Error.
- P7ZW8N (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L69.
- RZJ8HC (X) - Data for sample L69 are high.
- VM2NDX (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L70.
- YDNUV2 (X) - Data for sample L69 are low. Inconsistent within the determinations of both samples.
- ZC78RC (X) - Data for sample L70 are high.
- ZRKBCL (X) - Data for both samples are low. Possible Systematic Error.
- ZYLHZ3 (X) - Data for sample L69 are low.



Fasteners and Metals Interlaboratory Testing Program

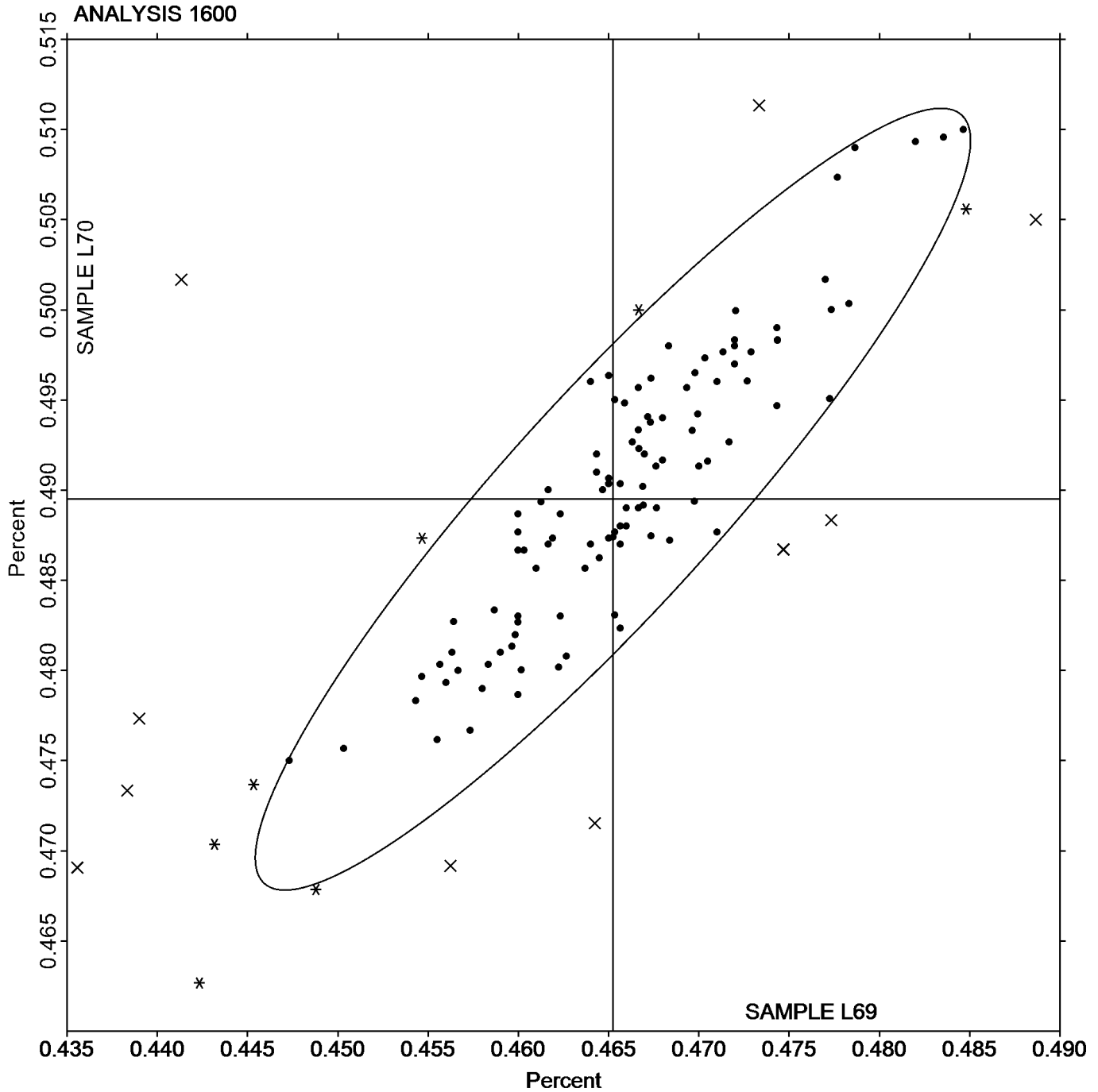
Cycle 131
3rd Qtr 2020

Analysis 1600

Carbon & Low Alloy Steel, CARBON (C)
CARBON (C)

SAMPLE L69
0.4652 Percent

SAMPLE L70
0.4895 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1601

Carbon & Low Alloy Steel, MANGANESE (Mn)
MANGANESE (Mn)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | X | 0.6613 | -0.0485 | -6.48 | 0.7238 | -0.0587 | -7.17 | OE |
| 2GKXZT | | 0.7267 | 0.0168 | 2.25 | 0.7997 | 0.0172 | 2.10 | OE |
| 2HRC8Y | * | 0.7103 | 0.0005 | 0.07 | 0.7973 | 0.0149 | 1.82 | GD |
| 2J6V3P | * | 0.7297 | 0.0198 | 2.65 | 0.7887 | 0.0062 | 0.76 | OE |
| 2KE2HY | | 0.7100 | 0.0002 | 0.02 | 0.7800 | -0.0025 | -0.30 | OE |
| 2KJ9VT | | 0.7173 | 0.0075 | 1.00 | 0.7933 | 0.0109 | 1.33 | OE |
| 2M68YP | * | 0.7184 | 0.0086 | 1.15 | 0.7651 | -0.0174 | -2.12 | OE |
| 3JHXDV | | 0.7053 | -0.0045 | -0.60 | 0.7754 | -0.0071 | -0.87 | OE |
| 3KDPZ2 | | 0.7123 | 0.0025 | 0.33 | 0.7840 | 0.0015 | 0.19 | WD |
| 3RC47W | | 0.7093 | -0.0005 | -0.07 | 0.7827 | 0.0002 | 0.03 | OE |
| 4434EQ | | 0.7100 | 0.0002 | 0.02 | 0.7807 | -0.0018 | -0.22 | OE |
| 46C9RE | | 0.7127 | 0.0028 | 0.38 | 0.7793 | -0.0031 | -0.38 | OE |
| 4CDPZY | | 0.7124 | 0.0026 | 0.34 | 0.7814 | -0.0010 | -0.13 | XX |
| 4XEJBA | | 0.7177 | 0.0078 | 1.05 | 0.7883 | 0.0059 | 0.72 | OE |
| 4YBU7D | X | 0.6877 | -0.0222 | -2.96 | 0.7720 | -0.0105 | -1.28 | OE |
| 629VJF | | 0.6990 | -0.0108 | -1.45 | 0.7653 | -0.0171 | -2.09 | OE |
| 6MPCPQ | * | 0.7157 | 0.0058 | 0.78 | 0.8027 | 0.0202 | 2.47 | XX |
| 73XQG8 | * | 0.7236 | 0.0138 | 1.84 | 0.7897 | 0.0072 | 0.88 | IC |
| 7LFM28 | | 0.7080 | -0.0018 | -0.24 | 0.7750 | -0.0075 | -0.91 | AE |
| 7Q4AR7 | | 0.7123 | 0.0025 | 0.33 | 0.7847 | 0.0022 | 0.27 | OE |
| 7WUJ36 | | 0.7111 | 0.0013 | 0.17 | 0.7823 | -0.0002 | -0.02 | OE |
| 86HURQ | | 0.7036 | -0.0062 | -0.83 | 0.7771 | -0.0054 | -0.65 | IC |
| 8G3ZAN | | 0.7047 | -0.0052 | -0.69 | 0.7787 | -0.0038 | -0.46 | OE |
| 962X2C | | 0.7170 | 0.0072 | 0.96 | 0.7940 | 0.0115 | 1.41 | OE |
| 99VYYK | * | 0.7043 | -0.0055 | -0.73 | 0.7863 | 0.0038 | 0.47 | IC |
| 9DV7L3 | | 0.7286 | 0.0188 | 2.51 | 0.7983 | 0.0158 | 1.93 | XX |
| 9GUGFH | | 0.7125 | 0.0026 | 0.35 | 0.7807 | -0.0018 | -0.22 | OE |
| 9JKHL6 | | 0.7050 | -0.0048 | -0.64 | 0.7800 | -0.0025 | -0.30 | OE |
| 9L4TGN | | 0.7067 | -0.0032 | -0.42 | 0.7790 | -0.0035 | -0.42 | OE |
| 9NU2FR | | 0.7047 | -0.0052 | -0.69 | 0.7803 | -0.0021 | -0.26 | OE |
| 9RB4R4 | | 0.7147 | 0.0048 | 0.65 | 0.7843 | 0.0019 | 0.23 | OE |
| 9UL26L | | 0.7033 | -0.0065 | -0.87 | 0.7763 | -0.0061 | -0.75 | AE |
| A2XP8L | | 0.7213 | 0.0115 | 1.54 | 0.7937 | 0.0112 | 1.37 | AE |
| AMFWLZ | | 0.7100 | 0.0002 | 0.02 | 0.7800 | -0.0025 | -0.30 | AA |
| C3YA9Q | | 0.7170 | 0.0072 | 0.96 | 0.7903 | 0.0079 | 0.96 | IC |
| C3YELE | X | 0.7347 | 0.0248 | 3.32 | 0.8153 | 0.0329 | 4.01 | OE |
| CBD7YJ | | 0.7167 | 0.0068 | 0.91 | 0.7870 | 0.0045 | 0.55 | IC |
| CEA2FX | | 0.7165 | 0.0067 | 0.90 | 0.7871 | 0.0046 | 0.57 | OE |
| CEYZUY | | 0.7047 | -0.0052 | -0.69 | 0.7783 | -0.0041 | -0.50 | OE |
| CGY9X9 | | 0.7029 | -0.0069 | -0.92 | 0.7787 | -0.0038 | -0.46 | OE |
| CHXDE3 | | 0.6977 | -0.0122 | -1.62 | 0.7693 | -0.0131 | -1.60 | OE |
| CTVAJP | | 0.7100 | 0.0002 | 0.02 | 0.7800 | -0.0025 | -0.30 | OE |
| CU8QW4 | | 0.7077 | -0.0022 | -0.29 | 0.7767 | -0.0058 | -0.71 | GD |
| D7E2XY | X | 0.7050 | -0.0048 | -0.64 | 0.8080 | 0.0255 | 3.12 | OE |
| D7YZUW | | 0.7063 | -0.0035 | -0.47 | 0.7837 | 0.0012 | 0.15 | OE |
| D9N7C9 | | 0.7061 | -0.0037 | -0.50 | 0.7677 | -0.0148 | -1.81 | OE |
| DH7RFG | | 0.7000 | -0.0098 | -1.31 | 0.7733 | -0.0091 | -1.11 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1601

Carbon & Low Alloy Steel, MANGANESE (Mn)
MANGANESE (Mn)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | | 0.6984 | -0.0114 | -1.52 | 0.7791 | -0.0033 | -0.41 | XX |
| DKGRGH | | 0.7200 | 0.0102 | 1.36 | 0.7933 | 0.0109 | 1.33 | OE |
| DLALF8 | | 0.6950 | -0.0148 | -1.98 | 0.7633 | -0.0191 | -2.34 | OE |
| DNF4E3 | | 0.7070 | -0.0028 | -0.38 | 0.7780 | -0.0045 | -0.54 | OE |
| DT9842 | | 0.7067 | -0.0032 | -0.42 | 0.7900 | 0.0075 | 0.92 | OE |
| DWVPLL | | 0.7037 | -0.0062 | -0.82 | 0.7773 | -0.0051 | -0.63 | OE |
| EK984Y | | 0.7053 | -0.0045 | -0.60 | 0.7780 | -0.0045 | -0.54 | OE |
| EXW8Y8 | | 0.7127 | 0.0028 | 0.38 | 0.7757 | -0.0068 | -0.83 | OE |
| EYTPYN | | 0.7121 | 0.0023 | 0.31 | 0.7837 | 0.0012 | 0.15 | OE |
| F6GPUU | | 0.7042 | -0.0056 | -0.75 | 0.7800 | -0.0025 | -0.30 | OE |
| F7QPWG | | 0.7100 | 0.0002 | 0.02 | 0.7833 | 0.0009 | 0.11 | GD |
| F8HXWJ | | 0.7183 | 0.0085 | 1.13 | 0.7924 | 0.0100 | 1.22 | OE |
| FA84EV | | 0.7007 | -0.0092 | -1.22 | 0.7730 | -0.0095 | -1.16 | OE |
| FCCRW7 | | 0.7064 | -0.0035 | -0.46 | 0.7808 | -0.0017 | -0.20 | OE |
| FEZ4VC | | 0.6953 | -0.0145 | -1.94 | 0.7677 | -0.0148 | -1.81 | OE |
| FFVMWD | | 0.7130 | 0.0032 | 0.42 | 0.7840 | 0.0015 | 0.19 | OE |
| FPMXBE | | 0.7119 | 0.0020 | 0.27 | 0.7870 | 0.0045 | 0.55 | OE |
| FTHWGX | | 0.6974 | -0.0124 | -1.66 | 0.7669 | -0.0156 | -1.90 | OE |
| G4JUQJ | | 0.7153 | 0.0055 | 0.74 | 0.7863 | 0.0039 | 0.47 | AE |
| GY7VD4 | | 0.7200 | 0.0102 | 1.36 | 0.7933 | 0.0109 | 1.33 | OE |
| H7K4CK | | 0.7130 | 0.0032 | 0.42 | 0.7840 | 0.0015 | 0.19 | OE |
| HBFPNG | | 0.7100 | 0.0002 | 0.02 | 0.7800 | -0.0025 | -0.30 | OE |
| HHEK2L | * | 0.6973 | -0.0125 | -1.67 | 0.7813 | -0.0011 | -0.14 | IC |
| HJ4QGC | | 0.7195 | 0.0097 | 1.30 | 0.7946 | 0.0121 | 1.48 | OE |
| HRF2TC | | 0.7067 | -0.0032 | -0.42 | 0.7843 | 0.0019 | 0.23 | OE |
| J3FQAD | | 0.7073 | -0.0025 | -0.33 | 0.7827 | 0.0002 | 0.03 | OE |
| J4BEN3 | | 0.7047 | -0.0052 | -0.69 | 0.7733 | -0.0091 | -1.11 | OE |
| J94HFK | | 0.7033 | -0.0065 | -0.87 | 0.7770 | -0.0055 | -0.67 | OE |
| JVFECV | | 0.7160 | 0.0061 | 0.82 | 0.7884 | 0.0059 | 0.73 | OE |
| K3TPYU | | 0.7135 | 0.0037 | 0.49 | 0.7878 | 0.0053 | 0.65 | OE |
| K4P697 | | 0.6937 | -0.0162 | -2.16 | 0.7697 | -0.0128 | -1.56 | OE |
| KJMALA | | 0.7223 | 0.0125 | 1.67 | 0.7923 | 0.0099 | 1.21 | OE |
| KNT624 | | 0.7150 | 0.0052 | 0.69 | 0.7897 | 0.0072 | 0.88 | OE |
| KU4YHU | | 0.7117 | 0.0018 | 0.25 | 0.7867 | 0.0042 | 0.51 | XX |
| LCKF89 | | 0.7117 | 0.0018 | 0.25 | 0.7803 | -0.0021 | -0.26 | XX |
| LHLYY7 | | 0.7127 | 0.0028 | 0.38 | 0.7837 | 0.0012 | 0.15 | OE |
| LYWBYC | | 0.7050 | -0.0048 | -0.64 | 0.7803 | -0.0021 | -0.26 | OE |
| MTXLKC | | 0.6984 | -0.0114 | -1.52 | 0.7756 | -0.0069 | -0.84 | OE |
| MYL9FG | | 0.7063 | -0.0035 | -0.47 | 0.7780 | -0.0045 | -0.54 | OE |
| NDG3C9 | | 0.7090 | -0.0008 | -0.11 | 0.7833 | 0.0009 | 0.11 | OE |
| NEBXTP | | 0.7187 | 0.0089 | 1.19 | 0.7997 | 0.0172 | 2.10 | XX |
| NGYARV | | 0.6993 | -0.0105 | -1.40 | 0.7710 | -0.0115 | -1.40 | DR |
| NJ6RQQ | | 0.7033 | -0.0065 | -0.87 | 0.7733 | -0.0091 | -1.11 | XX |
| NNKXVD | | 0.7223 | 0.0125 | 1.67 | 0.7957 | 0.0132 | 1.61 | OE |
| NPC426 | | 0.7100 | 0.0002 | 0.02 | 0.7857 | 0.0032 | 0.39 | OE |
| NRJAQD | | 0.7103 | 0.0005 | 0.07 | 0.7873 | 0.0049 | 0.60 | OE |
| P2PLEU | | 0.7090 | -0.0008 | -0.11 | 0.7810 | -0.0014 | -0.17 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1601

Carbon & Low Alloy Steel, MANGANESE (Mn)
MANGANESE (Mn)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| P4QQRE | | 0.7027 | -0.0072 | -0.96 | 0.7743 | -0.0081 | -0.99 | IC |
| P7ZW8N | | 0.6980 | -0.0118 | -1.58 | 0.7709 | -0.0116 | -1.41 | OE |
| PBUNLD | | 0.7183 | 0.0085 | 1.14 | 0.7973 | 0.0149 | 1.82 | OE |
| PDLKB8 | | 0.7133 | 0.0035 | 0.47 | 0.7877 | 0.0052 | 0.64 | OE |
| PQ4G6A | | 0.7096 | -0.0003 | -0.03 | 0.7818 | -0.0007 | -0.08 | OE |
| PQJZP8 | | 0.7030 | -0.0069 | -0.92 | 0.7833 | 0.0008 | 0.10 | IC |
| PRX8BN | | 0.7075 | -0.0023 | -0.31 | 0.7842 | 0.0017 | 0.21 | OE |
| Q9GFPX | | 0.7077 | -0.0022 | -0.29 | 0.7750 | -0.0075 | -0.91 | OE |
| QRWPTJ | | 0.7290 | 0.0192 | 2.56 | 0.8033 | 0.0209 | 2.55 | GD |
| QT3ET8 | | 0.7260 | 0.0162 | 2.16 | 0.7970 | 0.0145 | 1.78 | GD |
| R8F3HV | | 0.7187 | 0.0088 | 1.18 | 0.7980 | 0.0155 | 1.90 | IC |
| RA9VEZ | | 0.7133 | 0.0035 | 0.47 | 0.7870 | 0.0045 | 0.55 | OE |
| RHNHN4 | | 0.7168 | 0.0070 | 0.93 | 0.7894 | 0.0069 | 0.85 | OE |
| RZJ8HC | | 0.7116 | 0.0017 | 0.23 | 0.7863 | 0.0038 | 0.46 | OE |
| T68AZ3 | X | 0.7510 | 0.0412 | 5.50 | 0.8170 | 0.0345 | 4.22 | IC |
| T7QXM3 | | 0.7116 | 0.0018 | 0.24 | 0.7861 | 0.0036 | 0.44 | OE |
| T8HUAC | | 0.7044 | -0.0054 | -0.72 | 0.7782 | -0.0043 | -0.52 | IC |
| T8Z3ZR | | 0.7113 | 0.0015 | 0.20 | 0.7850 | 0.0025 | 0.31 | IC |
| TZJHYZ | | 0.6967 | -0.0132 | -1.76 | 0.7633 | -0.0191 | -2.34 | OE |
| U3LRHG | * | 0.7100 | 0.0002 | 0.02 | 0.7700 | -0.0125 | -1.52 | OE |
| UJ96YU | | 0.7220 | 0.0122 | 1.63 | 0.7920 | 0.0095 | 1.17 | XX |
| UN4W8R | * | 0.7167 | 0.0068 | 0.91 | 0.7767 | -0.0058 | -0.71 | IC |
| UPDZ23 | | 0.7129 | 0.0031 | 0.42 | 0.7918 | 0.0093 | 1.14 | OE |
| V4BFHN | | 0.6977 | -0.0122 | -1.62 | 0.7693 | -0.0131 | -1.60 | XX |
| VDCZHV | | 0.7033 | -0.0065 | -0.87 | 0.7783 | -0.0041 | -0.50 | IC |
| VM2NDX | | 0.7180 | 0.0082 | 1.09 | 0.7980 | 0.0155 | 1.90 | OE |
| VU3W4Y | | 0.7020 | -0.0078 | -1.05 | 0.7763 | -0.0061 | -0.75 | OE |
| VU6QHX | | 0.7028 | -0.0071 | -0.94 | 0.7703 | -0.0122 | -1.49 | OE |
| VWVTQ8 | | 0.7170 | 0.0072 | 0.96 | 0.7870 | 0.0045 | 0.55 | IC |
| VYXQ2Z | | 0.7090 | -0.0008 | -0.11 | 0.7767 | -0.0058 | -0.71 | OE |
| W9XMCG | | 0.7137 | 0.0038 | 0.51 | 0.7853 | 0.0029 | 0.35 | IC |
| WB4822 | | 0.7145 | 0.0047 | 0.62 | 0.7853 | 0.0028 | 0.35 | IC |
| WPNM8M | X | 0.6067 | -0.1032 | -13.78 | 0.7763 | -0.0061 | -0.75 | AE |
| WRDR4Z | | 0.6997 | -0.0102 | -1.36 | 0.7750 | -0.0075 | -0.91 | OE |
| WVEXGK | | 0.7096 | -0.0002 | -0.03 | 0.7822 | -0.0003 | -0.04 | OE |
| X366CV | | 0.7064 | -0.0034 | -0.46 | 0.7797 | -0.0028 | -0.34 | OE |
| XD7BMW | | 0.7117 | 0.0018 | 0.25 | 0.7793 | -0.0031 | -0.38 | XX |
| XL29E7 | | 0.7127 | 0.0028 | 0.38 | 0.7833 | 0.0009 | 0.11 | OE |
| YDNUV2 | | 0.7127 | 0.0028 | 0.38 | 0.7877 | 0.0052 | 0.64 | OE |
| YHF7LQ | | 0.7063 | -0.0035 | -0.47 | 0.7833 | 0.0009 | 0.11 | DR |
| YPJTYZ | X | 0.7073 | -0.0025 | -0.33 | 0.7413 | -0.0411 | -5.02 | OE |
| YQURVU | | 0.7083 | -0.0015 | -0.20 | 0.7780 | -0.0045 | -0.54 | IC |
| YWGHP | | 0.7200 | 0.0102 | 1.36 | 0.7933 | 0.0109 | 1.33 | XX |
| YZFTDP | | 0.7033 | -0.0065 | -0.87 | 0.7803 | -0.0021 | -0.26 | IC |
| ZC78RC | | 0.7090 | -0.0008 | -0.11 | 0.7753 | -0.0071 | -0.87 | GD |
| ZD2N8V | | 0.6998 | -0.0100 | -1.34 | 0.7686 | -0.0139 | -1.69 | OE |
| ZHURVT | X | 0.7593 | 0.0495 | 6.61 | 0.8387 | 0.0562 | 6.86 | XR |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1601

Carbon & Low Alloy Steel, MANGANESE (Mn)
MANGANESE (Mn)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| ZM9KVX | | 0.7117 | 0.0018 | 0.25 | 0.7807 | -0.0018 | -0.22 | OE |
| ZRKBCL | | 0.7022 | -0.0076 | -1.02 | 0.7767 | -0.0058 | -0.71 | OE |
| ZYLHZ3 | | 0.7260 | 0.0162 | 2.16 | 0.7943 | 0.0119 | 1.45 | OE |

Summary Statistics

| | Sample L69 | | Sample L70 | |
|---------------------------|------------|---------|------------|---------|
| Grand Means | 0.7098 | Percent | 0.7825 | Percent |
| Stnd Dev Btwn Labs | 0.0075 | Percent | 0.0082 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 129 of 144 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1601

- 2AWLDB (X) - Data for both samples are low. Possible Systematic Error.
- 4YBU7D (X) - Data for sample L69 are low.
- C3YELE (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L69.
- D7E2XY (X) - Data for sample L70 are high. Inconsistent within the determinations of sample L69.
- T68AZ3 (X) - Data for both samples are high. Possible Systematic Error.
- WPNM8M (X) - Data for sample L69 are low. Inconsistent within the determinations of sample L69.
- YPJTYZ (X) - Data for sample L70 are low.
- ZHURVT (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.



Fasteners and Metals Interlaboratory Testing Program

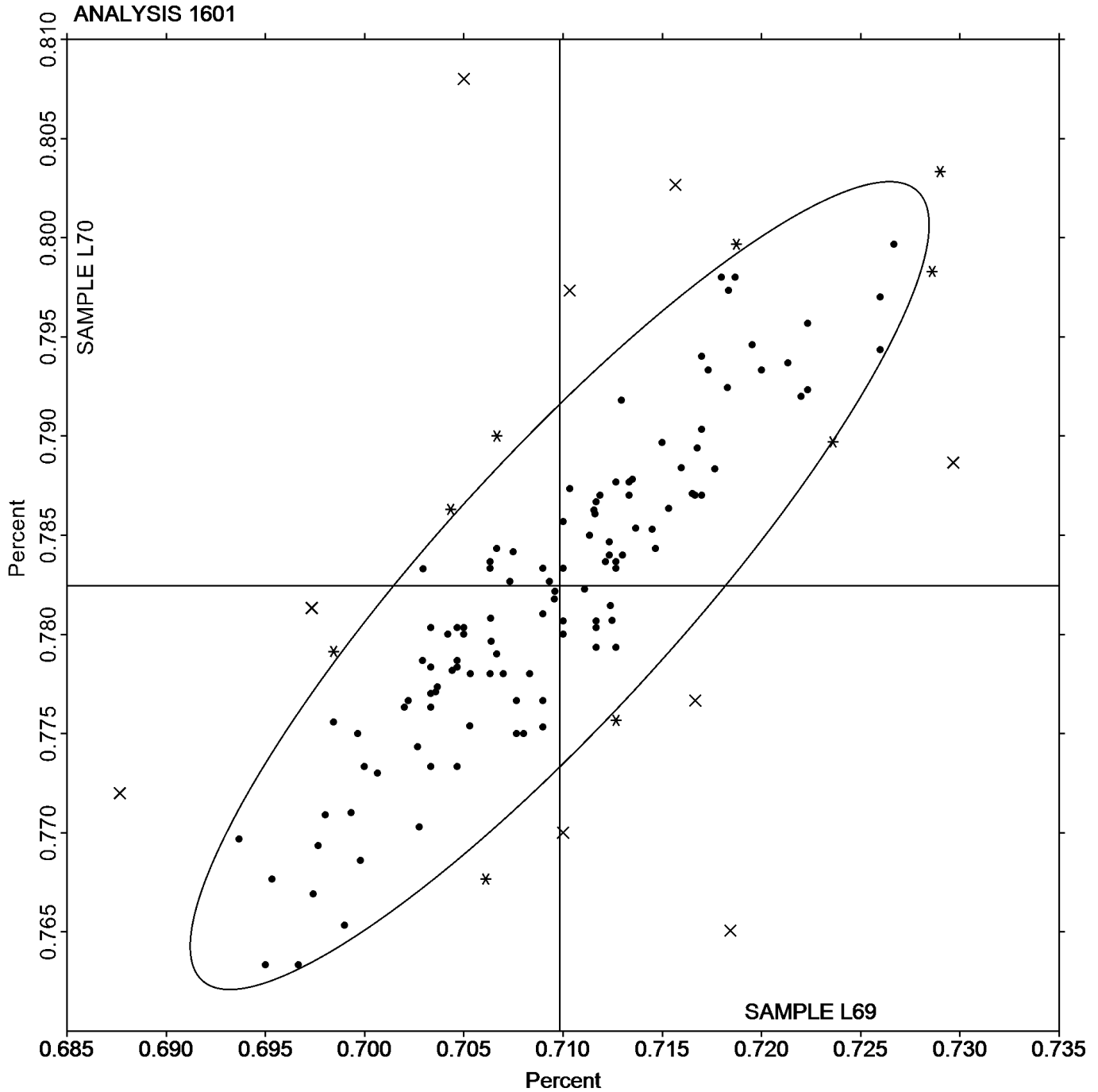
Cycle 131
3rd Qtr 2020

Analysis 1601

Carbon & Low Alloy Steel, MANGANESE (Mn)
MANGANESE (Mn)

SAMPLE L69
0.7098 Percent

SAMPLE L70
0.7825 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1602

Carbon & Low Alloy Steel, PHOSPHORUS (P)
PHOSPHORUS (P)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | | 0.00574 | -0.00101 | -0.91 | 0.0105 | -0.0009 | -0.80 | OE |
| 2GKXZT | | 0.00907 | 0.00232 | 2.10 | 0.0139 | 0.0025 | 2.22 | OE |
| 2HRC8Y | | 0.00923 | 0.00249 | 2.25 | 0.0130 | 0.0016 | 1.44 | GD |
| 2J6V3P | | 0.00813 | 0.00139 | 1.26 | 0.0121 | 0.0007 | 0.67 | OE |
| 2KE2HY | * | 0.00567 | -0.00108 | -0.97 | 0.00900 | -0.0024 | -2.14 | OE |
| 2KJ9VT | | 0.00650 | -0.00024 | -0.22 | 0.0113 | -0.0001 | -0.05 | OE |
| 2M68YP | | 0.00913 | 0.00239 | 2.16 | 0.0130 | 0.0016 | 1.44 | OE |
| 3JHXDV | | 0.00668 | -0.00007 | -0.06 | 0.0114 | 0.0000 | 0.03 | OE |
| 3KDPZ2 | | 0.00620 | -0.00054 | -0.49 | 0.0109 | -0.0005 | -0.41 | OE |
| 3RC47W | * | 0.00967 | 0.00292 | 2.64 | 0.0143 | 0.0029 | 2.64 | OE |
| 4434EQ | | 0.00657 | -0.00018 | -0.16 | 0.0105 | -0.0009 | -0.83 | OE |
| 46C9RE | | 0.00550 | -0.00124 | -1.12 | 0.0109 | -0.0005 | -0.41 | OE |
| 4CDPZY | M | No Data Reported | | | 0.0121 | 0.0007 | 0.61 | XX |
| 4XEJBA | | 0.00900 | 0.00226 | 2.04 | 0.0140 | 0.0026 | 2.34 | OE |
| 4YBU7D | | 0.00910 | 0.00236 | 2.13 | 0.0132 | 0.0018 | 1.59 | OE |
| 629VJF | | 0.00600 | -0.00074 | -0.67 | 0.0107 | -0.0007 | -0.65 | OE |
| 6MPCPQ | X | 0.00300 | -0.00374 | -3.38 | 0.00767 | -0.0037 | -3.34 | XX |
| 73XQG8 | | 0.00823 | 0.00149 | 1.35 | 0.0135 | 0.0021 | 1.86 | IC |
| 7LFM28 | | 0.00747 | 0.00072 | 0.65 | 0.0126 | 0.0012 | 1.06 | AE |
| 7Q4AR7 | | 0.00587 | -0.00088 | -0.79 | 0.0111 | -0.0003 | -0.29 | OE |
| 7WUJ36 | | 0.00620 | -0.00054 | -0.49 | 0.0112 | -0.0002 | -0.17 | OE |
| 86HURQ | | 0.00530 | -0.00144 | -1.30 | 0.00990 | -0.0015 | -1.34 | IC |
| 8G3ZAN | | 0.00700 | 0.00026 | 0.23 | 0.0120 | 0.0006 | 0.55 | OE |
| 962X2C | X | 0.00837 | 0.00162 | 1.47 | 0.0167 | 0.0053 | 4.73 | OE |
| 99VYYK | | 0.00670 | -0.00004 | -0.04 | 0.0112 | -0.0002 | -0.17 | IC |
| 9DV7L3 | | 0.00573 | -0.00101 | -0.91 | 0.0107 | -0.0007 | -0.62 | XX |
| 9GUGFH | | 0.00697 | 0.00022 | 0.20 | 0.0118 | 0.0004 | 0.40 | OE |
| 9JKHL6 | | 0.00660 | -0.00014 | -0.13 | 0.0120 | 0.0006 | 0.55 | OE |
| 9L4TGN | | 0.00600 | -0.00074 | -0.67 | 0.0110 | -0.0004 | -0.35 | OE |
| 9NU2FR | | 0.00900 | 0.00226 | 2.04 | 0.0133 | 0.0019 | 1.74 | OE |
| 9RB4R4 | | 0.00647 | -0.00028 | -0.25 | 0.0119 | 0.0005 | 0.46 | OE |
| 9UL26L | | 0.00807 | 0.00132 | 1.20 | 0.0128 | 0.0014 | 1.26 | AE |
| A2XP8L | | 0.00730 | 0.00056 | 0.50 | 0.0125 | 0.0011 | 1.03 | AE |
| C3YA9Q | | 0.00600 | -0.00074 | -0.67 | 0.0107 | -0.0007 | -0.65 | IC |
| C3YELE | X | 0.0121 | 0.00539 | 4.86 | 0.0148 | 0.0034 | 3.03 | OE |
| CBD7YJ | | 0.00687 | 0.00012 | 0.11 | 0.0107 | -0.0007 | -0.65 | IC |
| CEA2FX | | 0.00710 | 0.00036 | 0.32 | 0.0117 | 0.0003 | 0.31 | OE |
| CEYZUY | | 0.00667 | -0.00008 | -0.07 | 0.0120 | 0.0006 | 0.55 | OE |
| CGY9X9 | | 0.00627 | -0.00048 | -0.43 | 0.0108 | -0.0006 | -0.56 | OE |
| CHXDE3 | | 0.00687 | 0.00012 | 0.11 | 0.0113 | -0.0001 | -0.05 | OE |
| CTVAJP | | 0.00567 | -0.00108 | -0.97 | 0.0110 | -0.0004 | -0.35 | OE |
| CU8QW4 | X | 0.00467 | -0.00208 | -1.87 | 0.00733 | -0.0041 | -3.64 | GD |
| D7E2XY | X | 0.0100 | 0.00326 | 2.94 | 0.0113 | -0.0001 | -0.05 | OE |
| D7YZUW | | 0.00600 | -0.00074 | -0.67 | 0.0113 | -0.0001 | -0.05 | OE |
| D9N7C9 | * | 0.00340 | -0.00334 | -3.02 | 0.00813 | -0.0033 | -2.92 | OE |
| DH7RFG | | 0.00567 | -0.00108 | -0.97 | 0.00967 | -0.0017 | -1.55 | IC |
| DJJEVB | | 0.00737 | 0.00063 | 0.57 | 0.0108 | -0.0006 | -0.56 | XX |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1602

Carbon & Low Alloy Steel, PHOSPHORUS (P)
PHOSPHORUS (P)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DKGRGH | X | 0.0107 | 0.00392 | 3.54 | 0.0120 | 0.0006 | 0.55 | OE |
| DLALF8 | | 0.00600 | -0.00074 | -0.67 | 0.0110 | -0.0004 | -0.35 | OE |
| DNF4E3 | | 0.00847 | 0.00172 | 1.56 | 0.0117 | 0.0003 | 0.28 | OE |
| DT9842 | X | 0.00567 | -0.00108 | -0.97 | 0.00667 | -0.0047 | -4.24 | OE |
| DWVPLL | | 0.00613 | -0.00061 | -0.55 | 0.0110 | -0.0004 | -0.38 | OE |
| EK984Y | | 0.00670 | -0.00004 | -0.04 | 0.0109 | -0.0005 | -0.41 | OE |
| EXW8Y8 | | 0.00500 | -0.00174 | -1.57 | 0.00913 | -0.0023 | -2.02 | OE |
| EYTPYN | | 0.00623 | -0.00051 | -0.46 | 0.0114 | 0.0000 | -0.02 | OE |
| F6GPUU | | 0.00600 | -0.00074 | -0.67 | 0.0107 | -0.0007 | -0.62 | OE |
| F7QPWG | | 0.00600 | -0.00074 | -0.67 | 0.0100 | -0.0014 | -1.25 | GD |
| F8HXWJ | | 0.00597 | -0.00078 | -0.70 | 0.0109 | -0.0005 | -0.47 | OE |
| FA84EV | | 0.00600 | -0.00074 | -0.67 | 0.0107 | -0.0007 | -0.65 | OE |
| FCCRW7 | | 0.00623 | -0.00051 | -0.46 | 0.0109 | -0.0005 | -0.41 | OE |
| FEZ4VC | | 0.00577 | -0.00098 | -0.88 | 0.0107 | -0.0007 | -0.62 | OE |
| FFVMWD | | 0.00640 | -0.00034 | -0.31 | 0.0113 | -0.0001 | -0.08 | XX |
| FPMXBE | | 0.00663 | -0.00011 | -0.10 | 0.0118 | 0.0004 | 0.37 | OE |
| FTHWGX | | 0.00812 | 0.00138 | 1.24 | 0.0130 | 0.0016 | 1.43 | OE |
| G4JUQJ | | 0.00647 | -0.00028 | -0.25 | 0.0111 | -0.0003 | -0.23 | AE |
| GY7VD4 | | 0.00633 | -0.00041 | -0.37 | 0.0113 | -0.0001 | -0.08 | OE |
| H7K4CK | | 0.00600 | -0.00074 | -0.67 | 0.0110 | -0.0004 | -0.35 | OE |
| HBFPNG | | 0.00667 | -0.00008 | -0.07 | 0.0122 | 0.0008 | 0.76 | OE |
| HHEK2L | | 0.00570 | -0.00104 | -0.94 | 0.0104 | -0.0010 | -0.92 | CL |
| HJ4QGC | | 0.00837 | 0.00162 | 1.47 | 0.0116 | 0.0002 | 0.22 | OE |
| HRF2TC | | 0.00737 | 0.00062 | 0.56 | 0.0135 | 0.0021 | 1.89 | OE |
| J3FQAD | * | 0.00633 | -0.00041 | -0.37 | 0.00900 | -0.0024 | -2.14 | OE |
| J4BEN3 | M | No Data Reported | | | 0.00963 | -0.0018 | -1.58 | OE |
| J94HFK | | 0.00510 | -0.00164 | -1.48 | 0.0105 | -0.0009 | -0.83 | OE |
| JVFECV | | 0.00553 | -0.00122 | -1.10 | 0.00971 | -0.0017 | -1.51 | OE |
| K3TPYU | | 0.00673 | -0.00001 | -0.01 | 0.0112 | -0.0002 | -0.20 | OE |
| K4P697 | | 0.00787 | 0.00112 | 1.01 | 0.0124 | 0.0010 | 0.88 | XX |
| KJMALA | | 0.00693 | 0.00019 | 0.17 | 0.0126 | 0.0012 | 1.06 | OE |
| KNT624 | | 0.00657 | -0.00018 | -0.16 | 0.0118 | 0.0004 | 0.34 | OE |
| KU4YHU | | 0.00933 | 0.00259 | 2.34 | 0.0137 | 0.0023 | 2.04 | XX |
| LCKF89 | X | 0.00240 | -0.00434 | -3.92 | 0.00720 | -0.0042 | -3.76 | XX |
| LHLYY7 | | 0.00620 | -0.00054 | -0.49 | 0.0110 | -0.0004 | -0.38 | OE |
| LYWBYC | | 0.00553 | -0.00121 | -1.09 | 0.0114 | 0.0000 | 0.01 | XX |
| MTXLKC | | 0.00627 | -0.00048 | -0.43 | 0.0105 | -0.0009 | -0.77 | OE |
| MYL9FG | | 0.00567 | -0.00108 | -0.97 | 0.0100 | -0.0014 | -1.25 | OE |
| NDG3C9 | | 0.00750 | 0.00076 | 0.68 | 0.0112 | -0.0002 | -0.17 | OE |
| NEBXTTP | | 0.00637 | -0.00038 | -0.34 | 0.0118 | 0.0004 | 0.34 | XX |
| NGYARV | | 0.00707 | 0.00032 | 0.29 | 0.0118 | 0.0004 | 0.34 | DR |
| NJ6RQQ | | 0.00633 | -0.00041 | -0.37 | 0.0127 | 0.0013 | 1.15 | XX |
| NNKXVD | | 0.00700 | 0.00026 | 0.23 | 0.0122 | 0.0008 | 0.70 | OE |
| NPC426 | | 0.00603 | -0.00071 | -0.64 | 0.00967 | -0.0017 | -1.55 | OE |
| NRJAQD | | 0.00607 | -0.00068 | -0.61 | 0.0113 | -0.0001 | -0.05 | OE |
| P2PLEU | | 0.00703 | 0.00029 | 0.26 | 0.0115 | 0.0001 | 0.10 | OE |
| P4QQRE | | 0.00567 | -0.00108 | -0.97 | 0.00993 | -0.0015 | -1.31 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1602

Carbon & Low Alloy Steel, PHOSPHORUS (P)
PHOSPHORUS (P)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| P7ZW8N | | 0.00643 | -0.00031 | -0.28 | 0.0106 | -0.0008 | -0.74 | OE |
| PBUNLD | | 0.00800 | 0.00126 | 1.13 | 0.0128 | 0.0014 | 1.29 | OE |
| PDLKB8 | | 0.00653 | -0.00021 | -0.19 | 0.0109 | -0.0005 | -0.41 | OE |
| PQ4G6A | | 0.00580 | -0.00094 | -0.85 | 0.0101 | -0.0013 | -1.13 | OE |
| PQJZP8 | | 0.00537 | -0.00138 | -1.24 | 0.00997 | -0.0014 | -1.28 | IC |
| PRX8BN | | 0.00637 | -0.00038 | -0.34 | 0.0117 | 0.0003 | 0.25 | OE |
| Q9GFPX | | 0.00833 | 0.00159 | 1.44 | 0.0127 | 0.0013 | 1.15 | OE |
| QRWPTJ | | 0.00900 | 0.00226 | 2.04 | 0.0133 | 0.0019 | 1.74 | GD |
| QT3ET8 | | 0.00648 | -0.00026 | -0.24 | 0.0107 | -0.0007 | -0.62 | GD |
| R8F3HV | | 0.00733 | 0.00059 | 0.53 | 0.0113 | -0.0001 | -0.11 | IC |
| RA9VEZ | | 0.00667 | -0.00008 | -0.07 | 0.0112 | -0.0002 | -0.17 | OE |
| RHNHN4 | | 0.00546 | -0.00128 | -1.16 | 0.0105 | -0.0009 | -0.84 | OE |
| RZJ8HC | | 0.00600 | -0.00074 | -0.67 | 0.0113 | -0.0001 | -0.11 | OE |
| T68AZ3 | X | 0.0100 | 0.00326 | 2.94 | 0.0110 | -0.0004 | -0.35 | IC |
| T7QXM3 | | 0.00673 | -0.00001 | -0.01 | 0.0112 | -0.0002 | -0.14 | OE |
| T8HUAC | | 0.00633 | -0.00041 | -0.37 | 0.0107 | -0.0007 | -0.59 | IC |
| T8Z3ZR | | 0.00650 | -0.00024 | -0.22 | 0.0119 | 0.0005 | 0.46 | IC |
| TZJHYZ | | 0.00810 | 0.00136 | 1.23 | 0.0127 | 0.0013 | 1.15 | OE |
| U3LRHG | | 0.00950 | 0.00276 | 2.49 | 0.0130 | 0.0016 | 1.44 | OE |
| UJ96YU | | 0.00600 | -0.00074 | -0.67 | 0.0103 | -0.0011 | -0.95 | XX |
| UN4W8R | | 0.00597 | -0.00078 | -0.70 | 0.0102 | -0.0012 | -1.10 | IC |
| UPDZ23 | | 0.00683 | 0.00009 | 0.08 | 0.0115 | 0.0001 | 0.13 | OE |
| V4BFHN | | 0.00700 | 0.00026 | 0.23 | 0.0113 | -0.0001 | -0.05 | XX |
| VDCZHV | | 0.00703 | 0.00029 | 0.26 | 0.0119 | 0.0005 | 0.46 | IC |
| VM2NDX | | 0.00583 | -0.00091 | -0.82 | 0.0102 | -0.0012 | -1.07 | OE |
| VU3W4Y | | 0.00730 | 0.00056 | 0.50 | 0.0120 | 0.0006 | 0.52 | OE |
| VU6QHX | | 0.00670 | -0.00005 | -0.04 | 0.0115 | 0.0001 | 0.05 | OE |
| VWVTQ8 | * | 0.00967 | 0.00292 | 2.64 | 0.0143 | 0.0029 | 2.64 | IC |
| VYXQ2Z | | 0.00560 | -0.00114 | -1.03 | 0.0102 | -0.0012 | -1.10 | OE |
| W9XMCG | | 0.00563 | -0.00111 | -1.00 | 0.0108 | -0.0006 | -0.53 | IC |
| WB4822 | | 0.00600 | -0.00074 | -0.67 | 0.0104 | -0.0010 | -0.92 | IC |
| WPNM8M | | 0.00693 | 0.00019 | 0.17 | 0.0118 | 0.0004 | 0.37 | AE |
| WRDR4Z | X | 0.0113 | 0.00456 | 4.11 | 0.0165 | 0.0051 | 4.55 | OE |
| WVEXGK | | 0.00577 | -0.00098 | -0.88 | 0.0104 | -0.0010 | -0.86 | OE |
| X366CV | | 0.00665 | -0.00010 | -0.09 | 0.0116 | 0.0002 | 0.15 | OE |
| XD7BMW | | 0.00700 | 0.00026 | 0.23 | 0.0100 | -0.0014 | -1.25 | XX |
| XL29E7 | * | 0.00700 | 0.00026 | 0.23 | 0.00900 | -0.0024 | -2.14 | OE |
| YDNUV2 | | 0.00757 | 0.00082 | 0.74 | 0.0113 | -0.0001 | -0.11 | OE |
| YPJTYZ | | 0.00643 | -0.00031 | -0.28 | 0.0121 | 0.0007 | 0.64 | OE |
| YQURVU | | 0.00617 | -0.00058 | -0.52 | 0.0104 | -0.0010 | -0.86 | XX |
| YWGHP | X | 0.00233 | -0.00441 | -3.98 | 0.00700 | -0.0044 | -3.94 | XX |
| YZFTDP | | 0.00727 | 0.00052 | 0.47 | 0.0114 | 0.0000 | 0.04 | IC |
| ZC78RC | | 0.00833 | 0.00159 | 1.44 | 0.0130 | 0.0016 | 1.44 | GD |
| ZD2N8V | | 0.00681 | 0.00007 | 0.06 | 0.0119 | 0.0005 | 0.44 | OE |
| ZM9KVX | | 0.00650 | -0.00024 | -0.22 | 0.0115 | 0.0001 | 0.07 | OE |
| ZRKBC | | 0.00630 | -0.00044 | -0.40 | 0.0105 | -0.0009 | -0.77 | OE |
| ZYLHZ3 | | 0.00700 | 0.00026 | 0.23 | 0.0110 | -0.0004 | -0.35 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1602

Carbon & Low Alloy Steel, PHOSPHORUS (P)
PHOSPHORUS (P)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.00674 | Percent | 0.0114 | Percent |
| Std Dev Btwn Labs | 0.00111 | Percent | 0.0011 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 126 of 141 reporting participants

Key to Method Codes Reported by Participants

| | | | |
|----|---|----|---------------------------------------|
| AE | Spectrometry - Atomic Emission (AES) | CL | Colorimetry |
| DR | Spectrometry - Direct Reading OE (DROES) | GD | Spectrometry - Glow Discharge (GDS) |
| IC | Spectrometry - Inductively Coupled Plasma (ICP) | OE | Spectrometry - Optical Emission (OES) |
| XX | Please Indicate Method Used for Current Element | | |

Comments on Assigned Data Flags for Test #1602

- 4CDPZY (M) - Participant did not submit data for sample L69.
- 6MPCPQ (X) - Data for both samples are low. Possible Systematic Error.
- 962X2C (X) - Data for sample L70 are high.
- C3YELE (X) - Data for both samples are high. Possible Systematic Error.
- CU8QW4 (X) - Data for sample L70 are low.
- D7E2XY (X) - Data for sample L69 are high. Inconsistent within the determinations of both samples.
- DKGRGH (X) - Data for sample L69 are high.
- DT9842 (X) - Data for sample L70 are low. Inconsistent within the determinations of sample L69.
- J4BEN3 (M) - Participant did not submit data for sample L69.
- LCKF89 (X) - Data for both samples are low. Possible Systematic Error.
- T68AZ3 (X) - Data for sample L69 are high.
- WRDR4Z (X) - Data for both samples are high. Possible Systematic Error.
- YWGHP (X) - Data for both samples are low. Possible Systematic Error.



Fasteners and Metals Interlaboratory Testing Program

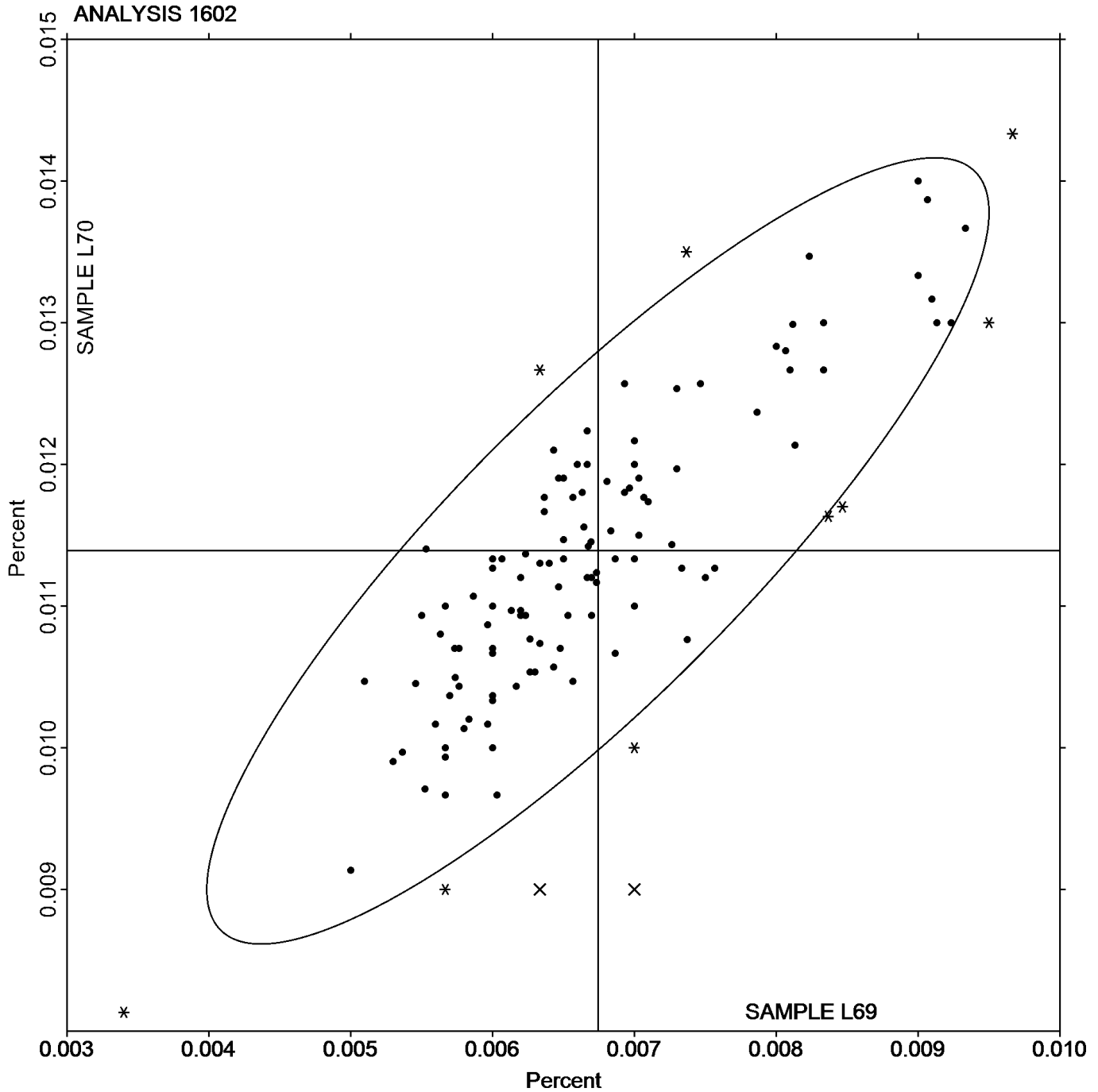
Cycle 131
3rd Qtr 2020

Analysis 1602

Carbon & Low Alloy Steel, PHOSPHORUS (P)
PHOSPHORUS (P)

SAMPLE L69
0.00674 Percent

SAMPLE L70
0.0114 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1603

Carbon & Low Alloy Steel, SULFUR (S)
SULFUR (S)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | | 0.0185 | -0.0018 | -1.28 | 0.0178 | -0.0017 | -1.10 | OE |
| 2GKXZT | | 0.0210 | 0.0007 | 0.49 | 0.0194 | 0.0000 | 0.00 | OE |
| 2HRC8Y | | 0.0217 | 0.0014 | 0.96 | 0.0207 | 0.0013 | 0.86 | GD |
| 2J6V3P | | 0.0216 | 0.0013 | 0.91 | 0.0216 | 0.0022 | 1.46 | OE |
| 2KE2HY | | 0.0183 | -0.0020 | -1.40 | 0.0163 | -0.0031 | -2.05 | OE |
| 2KJ9VT | | 0.0230 | 0.0027 | 1.90 | 0.0227 | 0.0032 | 2.14 | OE |
| 3JHXDV | | 0.0215 | 0.0012 | 0.82 | 0.0212 | 0.0017 | 1.14 | OE |
| 3KDPZ2 | | 0.0201 | -0.0002 | -0.12 | 0.0190 | -0.0005 | -0.31 | CI |
| 3RC47W | X | 0.0190 | -0.0013 | -0.93 | 0.0207 | 0.0012 | 0.82 | OE |
| 4434EQ | | 0.0202 | -0.0001 | -0.08 | 0.0192 | -0.0002 | -0.13 | OE |
| 46C9RE | | 0.0198 | -0.0005 | -0.38 | 0.0186 | -0.0008 | -0.55 | OE |
| 4CDPZY | | 0.0202 | -0.0001 | -0.10 | 0.0194 | -0.0001 | -0.04 | XX |
| 4XEJBA | | 0.0237 | 0.0034 | 2.38 | 0.0227 | 0.0032 | 2.14 | OE |
| 4YBU7D | X | 0.0244 | 0.0041 | 2.87 | 0.0215 | 0.0021 | 1.37 | OE |
| 629VJF | | 0.0207 | 0.0004 | 0.25 | 0.0200 | 0.0006 | 0.37 | OE |
| 6MPCPQ | | 0.0210 | 0.0007 | 0.49 | 0.0201 | 0.0007 | 0.46 | XX |
| 73XQG8 | | 0.0186 | -0.0017 | -1.21 | 0.0172 | -0.0022 | -1.46 | CI |
| 7LFM28 | | 0.0204 | 0.0001 | 0.07 | 0.0194 | -0.0001 | -0.04 | AE |
| 7Q4AR7 | | 0.0204 | 0.0001 | 0.07 | 0.0192 | -0.0002 | -0.13 | OE |
| 7WUJ36 | | 0.0223 | 0.0020 | 1.43 | 0.0200 | 0.0005 | 0.35 | OE |
| 86HURQ | | 0.0203 | 0.0000 | 0.02 | 0.0192 | -0.0002 | -0.13 | CI |
| 8G3ZAN | | 0.0197 | -0.0006 | -0.45 | 0.0203 | 0.0009 | 0.59 | OE |
| 962X2C | X | 0.0264 | 0.0061 | 4.31 | 0.0281 | 0.0087 | 5.76 | OE |
| 99VYYK | | 0.0189 | -0.0014 | -1.02 | 0.0175 | -0.0019 | -1.26 | CI |
| 9DV7L3 | | 0.0223 | 0.0020 | 1.43 | 0.0204 | 0.0009 | 0.62 | XX |
| 9GUGFH | | 0.0215 | 0.0012 | 0.84 | 0.0195 | 0.0001 | 0.04 | OE |
| 9JKHL6 | | 0.0187 | -0.0016 | -1.16 | 0.0188 | -0.0007 | -0.44 | CO |
| 9L4TGN | | 0.0230 | 0.0027 | 1.90 | 0.0220 | 0.0026 | 1.70 | CO |
| 9NU2FR | | 0.0213 | 0.0010 | 0.73 | 0.0201 | 0.0007 | 0.46 | CI |
| 9RB4R4 | | 0.0193 | -0.0010 | -0.69 | 0.0179 | -0.0015 | -0.99 | CI |
| 9UL26L | | 0.0191 | -0.0012 | -0.88 | 0.0178 | -0.0017 | -1.10 | AE |
| A2XP8L | | 0.0196 | -0.0007 | -0.48 | 0.0187 | -0.0007 | -0.49 | AE |
| C3YA9Q | | 0.0193 | -0.0010 | -0.69 | 0.0183 | -0.0011 | -0.73 | CI |
| C3YELE | X | 0.0120 | -0.0083 | -5.88 | 0.0116 | -0.0079 | -5.21 | OE |
| CBD7YJ | | 0.0192 | -0.0011 | -0.76 | 0.0183 | -0.0011 | -0.75 | CI |
| CEA2FX | | 0.0206 | 0.0003 | 0.21 | 0.0193 | -0.0001 | -0.09 | CO |
| CEYZUY | | 0.0207 | 0.0004 | 0.25 | 0.0193 | -0.0001 | -0.07 | OE |
| CGY9X9 | | 0.0196 | -0.0007 | -0.50 | 0.0185 | -0.0010 | -0.64 | OE |
| CHXDE3 | | 0.0193 | -0.0010 | -0.69 | 0.0183 | -0.0011 | -0.73 | OE |
| CTVAJP | | 0.0197 | -0.0006 | -0.45 | 0.0193 | -0.0001 | -0.07 | OE |
| CU8QW4 | X | 0.0163 | -0.0040 | -2.81 | 0.0140 | -0.0054 | -3.60 | GD |
| D7E2XY | | 0.0217 | 0.0014 | 0.96 | 0.0203 | 0.0009 | 0.59 | OE |
| D7YZUW | | 0.0200 | -0.0003 | -0.22 | 0.0200 | 0.0006 | 0.37 | OE |
| D9N7C9 | X | 0.0162 | -0.0041 | -2.93 | 0.0166 | -0.0028 | -1.88 | OE |
| DH7RFG | | 0.0173 | -0.0030 | -2.10 | 0.0173 | -0.0021 | -1.39 | IR |
| DJJEVB | | 0.0197 | -0.0006 | -0.40 | 0.0200 | 0.0005 | 0.35 | XX |
| DKGRGH | | 0.0197 | -0.0006 | -0.43 | 0.0177 | -0.0017 | -1.13 | CO |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1603

Carbon & Low Alloy Steel, SULFUR (S)
SULFUR (S)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DLALF8 | | 0.0213 | 0.0010 | 0.73 | 0.0197 | 0.0002 | 0.15 | OE |
| DNF4E3 | | 0.0209 | 0.0006 | 0.40 | 0.0191 | -0.0003 | -0.20 | OE |
| DT9842 | * | 0.0170 | -0.0033 | -2.34 | 0.0193 | -0.0001 | -0.07 | OE |
| DWVPLL | | 0.0206 | 0.0003 | 0.18 | 0.0194 | 0.0000 | -0.02 | CI |
| EK984Y | | 0.0212 | 0.0009 | 0.63 | 0.0194 | -0.0001 | -0.04 | OE |
| EYTPYN | | 0.0198 | -0.0005 | -0.36 | 0.0198 | 0.0004 | 0.24 | OE |
| F6GPUU | | 0.0196 | -0.0007 | -0.52 | 0.0188 | -0.0007 | -0.44 | OE |
| F7QPWG | | 0.0190 | -0.0013 | -0.93 | 0.0180 | -0.0014 | -0.95 | GD |
| F8HXWJ | | 0.0207 | 0.0004 | 0.25 | 0.0200 | 0.0006 | 0.37 | OE |
| FA84EV | | 0.0207 | 0.0004 | 0.25 | 0.0207 | 0.0012 | 0.82 | OE |
| FCCRW7 | | 0.0200 | -0.0003 | -0.24 | 0.0209 | 0.0014 | 0.95 | OE |
| FEZ4VC | | 0.0202 | -0.0001 | -0.10 | 0.0190 | -0.0004 | -0.29 | OE |
| FFVMWD | | 0.0190 | -0.0013 | -0.93 | 0.0180 | -0.0015 | -0.97 | XX |
| FPMXBE | | 0.0193 | -0.0010 | -0.74 | 0.0191 | -0.0003 | -0.22 | OE |
| FTHWGX | X | 0.0307 | 0.0104 | 7.37 | 0.0286 | 0.0092 | 6.06 | OE |
| G4JUQJ | | 0.0201 | -0.0002 | -0.17 | 0.0184 | -0.0010 | -0.68 | AE |
| GY7VD4 | | 0.0189 | -0.0014 | -1.02 | 0.0182 | -0.0013 | -0.84 | CI |
| H7K4CK | | 0.0200 | -0.0003 | -0.22 | 0.0190 | -0.0004 | -0.29 | OE |
| HBFPNG | | 0.0187 | -0.0016 | -1.16 | 0.0190 | -0.0004 | -0.29 | OE |
| HHEK2L | | 0.0209 | 0.0006 | 0.40 | 0.0197 | 0.0003 | 0.18 | CI |
| HJ4QGC | | 0.0229 | 0.0026 | 1.86 | 0.0226 | 0.0032 | 2.12 | OE |
| HRF2TC | X | 0.0121 | -0.0082 | -5.83 | 0.0139 | -0.0055 | -3.66 | OE |
| J3FQAD | | 0.0193 | -0.0010 | -0.69 | 0.0193 | -0.0001 | -0.07 | OE |
| J4BEN3 | | 0.0182 | -0.0021 | -1.47 | 0.0175 | -0.0019 | -1.28 | OE |
| J94HFK | | 0.0191 | -0.0012 | -0.88 | 0.0189 | -0.0006 | -0.38 | OE |
| JVFECV | | 0.0187 | -0.0016 | -1.17 | 0.0177 | -0.0017 | -1.13 | OE |
| K3TPYU | | 0.0217 | 0.0014 | 1.01 | 0.0189 | -0.0006 | -0.38 | OE |
| K4P697 | | 0.0221 | 0.0018 | 1.24 | 0.0203 | 0.0008 | 0.55 | OE |
| KJMALA | X | 0.0218 | 0.0015 | 1.03 | 0.0126 | -0.0069 | -4.55 | OE |
| KNT624 | | 0.0183 | -0.0020 | -1.40 | 0.0174 | -0.0020 | -1.35 | OE |
| KU4YHU | X | 0.0233 | 0.0030 | 2.14 | 0.0250 | 0.0056 | 3.68 | XX |
| LCKF89 | X | 0.0104 | -0.0099 | -7.01 | 0.0102 | -0.0092 | -6.09 | XX |
| LHLYY7 | | 0.0216 | 0.0013 | 0.89 | 0.0196 | 0.0002 | 0.11 | OE |
| LYWBVC | * | 0.0209 | 0.0006 | 0.40 | 0.0221 | 0.0026 | 1.74 | OE |
| MTXLKC | | 0.0196 | -0.0007 | -0.50 | 0.0189 | -0.0006 | -0.38 | CI |
| MYL9FG | | 0.0203 | 0.0000 | 0.02 | 0.0200 | 0.0006 | 0.37 | OE |
| NDG3C9 | | 0.0207 | 0.0004 | 0.30 | 0.0196 | 0.0001 | 0.09 | CI |
| NEBXTP | | 0.0205 | 0.0002 | 0.14 | 0.0187 | -0.0007 | -0.49 | XX |
| NGYARV | | 0.0225 | 0.0022 | 1.55 | 0.0224 | 0.0029 | 1.94 | DR |
| NJ6RQQ | | 0.0217 | 0.0014 | 0.96 | 0.0210 | 0.0016 | 1.04 | XX |
| NNXVVD | | 0.0176 | -0.0027 | -1.94 | 0.0171 | -0.0024 | -1.57 | OE |
| NPC426 | | 0.0198 | -0.0005 | -0.36 | 0.0202 | 0.0007 | 0.48 | OE |
| NRJAQD | | 0.0216 | 0.0013 | 0.91 | 0.0203 | 0.0008 | 0.55 | OE |
| P2PLEU | | 0.0201 | -0.0002 | -0.17 | 0.0204 | 0.0009 | 0.62 | OE |
| P4QQRE | | 0.0196 | -0.0007 | -0.52 | 0.0182 | -0.0012 | -0.82 | CI |
| P7ZW8N | | 0.0219 | 0.0016 | 1.15 | 0.0223 | 0.0029 | 1.92 | OE |
| PBUNLD | X | 0.0245 | 0.0042 | 2.99 | 0.0254 | 0.0060 | 3.95 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1603

Carbon & Low Alloy Steel, SULFUR (S)
SULFUR (S)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PDLKB8 | | 0.0176 | -0.0027 | -1.92 | 0.0168 | -0.0027 | -1.77 | OE |
| PQ4G6A | | 0.0200 | -0.0003 | -0.22 | 0.0183 | -0.0011 | -0.73 | OE |
| PQJZP8 | | 0.0201 | -0.0002 | -0.15 | 0.0183 | -0.0011 | -0.73 | CI |
| PRX8BN | | 0.0223 | 0.0020 | 1.43 | 0.0216 | 0.0022 | 1.43 | OE |
| Q9GFPX | | 0.0210 | 0.0007 | 0.49 | 0.0193 | -0.0001 | -0.07 | CI |
| QRWPTJ | | 0.0200 | -0.0003 | -0.22 | 0.0190 | -0.0004 | -0.29 | GD |
| QT3ET8 | | 0.0206 | 0.0003 | 0.21 | 0.0199 | 0.0005 | 0.31 | GD |
| R8F3HV | | 0.0180 | -0.0023 | -1.63 | 0.0163 | -0.0031 | -2.05 | CI |
| RA9VEZ | | 0.0206 | 0.0003 | 0.21 | 0.0203 | 0.0009 | 0.57 | OE |
| RHNHN4 | | 0.0204 | 0.0001 | 0.06 | 0.0194 | -0.0001 | -0.04 | OE |
| RZJ8HC | * | 0.0177 | -0.0026 | -1.82 | 0.0191 | -0.0003 | -0.20 | IR |
| T68AZ3 | | 0.0210 | 0.0007 | 0.49 | 0.0200 | 0.0006 | 0.37 | IC |
| T7QXM3 | | 0.0182 | -0.0021 | -1.47 | 0.0184 | -0.0011 | -0.71 | OE |
| T8Z3ZR | | 0.0202 | -0.0001 | -0.10 | 0.0198 | 0.0003 | 0.22 | CI |
| TZJHYZ | | 0.0227 | 0.0024 | 1.67 | 0.0217 | 0.0022 | 1.48 | OE |
| U3LRHG | | 0.0210 | 0.0007 | 0.49 | 0.0210 | 0.0016 | 1.04 | OE |
| UJ96YU | | 0.0233 | 0.0030 | 2.14 | 0.0220 | 0.0026 | 1.70 | XX |
| UN4W8R | | 0.0195 | -0.0008 | -0.59 | 0.0188 | -0.0006 | -0.42 | CI |
| UPDZ23 | * | 0.0239 | 0.0036 | 2.54 | 0.0202 | 0.0008 | 0.51 | OE |
| V4BFHN | | 0.0230 | 0.0027 | 1.90 | 0.0207 | 0.0012 | 0.82 | XX |
| VDCZHV | | 0.0184 | -0.0019 | -1.35 | 0.0172 | -0.0022 | -1.48 | CI |
| VM2NDX | | 0.0219 | 0.0016 | 1.13 | 0.0222 | 0.0028 | 1.83 | OE |
| VU3W4Y | | 0.0207 | 0.0004 | 0.25 | 0.0197 | 0.0003 | 0.20 | OE |
| VU6QHx | | 0.0209 | 0.0006 | 0.40 | 0.0194 | 0.0000 | -0.01 | OE |
| VWVTQ8 | | 0.0177 | -0.0026 | -1.87 | 0.0170 | -0.0024 | -1.61 | CI |
| VYXQ2Z | | 0.0217 | 0.0014 | 0.96 | 0.0207 | 0.0012 | 0.82 | CO |
| W9XMCG | | 0.0202 | -0.0001 | -0.10 | 0.0190 | -0.0004 | -0.27 | CI |
| WB4822 | | 0.0199 | -0.0004 | -0.31 | 0.0187 | -0.0007 | -0.46 | CI |
| WPNM8M | | 0.0213 | 0.0010 | 0.73 | 0.0200 | 0.0005 | 0.35 | XX |
| WRDR4Z | | 0.0207 | 0.0004 | 0.30 | 0.0199 | 0.0004 | 0.29 | XX |
| WVEXGK | | 0.0191 | -0.0012 | -0.83 | 0.0180 | -0.0014 | -0.93 | CI |
| X366CV | | 0.0213 | 0.0010 | 0.73 | 0.0221 | 0.0027 | 1.77 | OE |
| XD7BMW | * | 0.0223 | 0.0020 | 1.43 | 0.0187 | -0.0008 | -0.51 | XX |
| XL29E7 | | 0.0190 | -0.0013 | -0.93 | 0.0167 | -0.0028 | -1.83 | OE |
| YDNUV2 | X | 0.0154 | -0.0049 | -3.45 | 0.0146 | -0.0048 | -3.18 | CI |
| YHF7LQ | | 0.0190 | -0.0013 | -0.93 | 0.0190 | -0.0004 | -0.29 | DR |
| YPJTYZ | | 0.0203 | 0.0000 | 0.02 | 0.0198 | 0.0004 | 0.26 | OE |
| YQURVU | | 0.0192 | -0.0011 | -0.81 | 0.0183 | -0.0011 | -0.75 | CO |
| YWGHP | | 0.0193 | -0.0010 | -0.69 | 0.0193 | -0.0001 | -0.07 | XX |
| YZFTDP | | 0.0180 | -0.0023 | -1.63 | 0.0171 | -0.0024 | -1.57 | IC |
| ZC78RC | | 0.0233 | 0.0030 | 2.14 | 0.0230 | 0.0036 | 2.36 | GD |
| ZD2N8V | | 0.0224 | 0.0021 | 1.49 | 0.0213 | 0.0018 | 1.21 | OE |
| ZM9KVX | | 0.0234 | 0.0031 | 2.16 | 0.0230 | 0.0035 | 2.34 | OE |
| ZRKBCL | | 0.0180 | -0.0023 | -1.63 | 0.0171 | -0.0024 | -1.57 | OE |
| ZYLHZ3 | | 0.0197 | -0.0006 | -0.45 | 0.0183 | -0.0011 | -0.73 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1603

Carbon & Low Alloy Steel, SULFUR (S)
SULFUR (S)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.0203 | Percent | 0.0194 | Percent |
| Std Dev Btwn Labs | 0.0014 | Percent | 0.0015 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 122 of 139 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1603

- 3RC47W (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L70.
- 4YBU7D (X) - Data for sample L69 are high.
- 962X2C (X) - Data for both samples are high. Possible Systematic Error.
- C3YELE (X) - Data for both samples are low. Possible Systematic Error.
- CU8QW4 (X) - Data for both samples are low. Possible Systematic Error.
- D9N7C9 (X) - Data for sample L69 are low.
- FTHWGX (X) - Data for both samples are high. Possible Systematic Error.
- HRF2TC (X) - Data for both samples are low. Possible Systematic Error.
- KJMALA (X) - Data for sample L70 are low. Inconsistent within the determinations of sample L69.
- KU4YHU (X) - Data for sample L70 are high. Inconsistent within the determinations of sample L70.
- LCKF89 (X) - Data for both samples are low. Possible Systematic Error.
- PBUNLD (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L69.
- YDNUV2 (X) - Data for both samples are low. Possible Systematic Error.

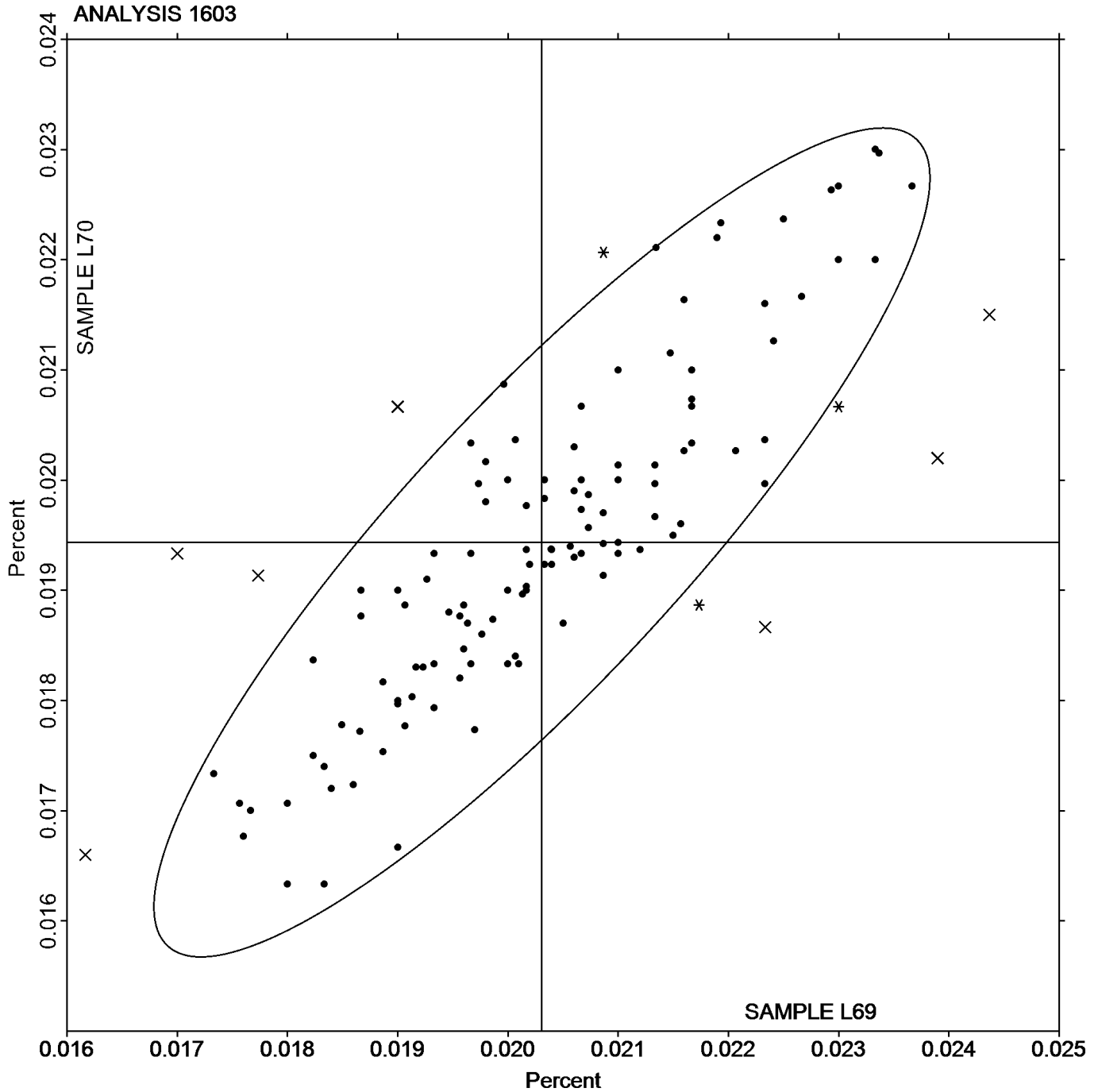


Analysis 1603

Carbon & Low Alloy Steel, SULFUR (S)
SULFUR (S)

SAMPLE L69
0.0203 Percent

SAMPLE L70
0.0194 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1604

Carbon & Low Alloy Steel, SILICON (Si)
SILICON (Si)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | | 0.2519 | -0.0166 | -2.46 | 0.2691 | -0.0157 | -2.28 | OE |
| 2GKXZT | | 0.2770 | 0.0085 | 1.27 | 0.2913 | 0.0065 | 0.95 | OE |
| 2HRC8Y | | 0.2680 | -0.0005 | -0.07 | 0.2893 | 0.0045 | 0.66 | GD |
| 2J6V3P | * | 0.2620 | -0.0065 | -0.96 | 0.2967 | 0.0119 | 1.73 | OE |
| 2KE2HY | | 0.2700 | 0.0015 | 0.23 | 0.2900 | 0.0052 | 0.76 | OE |
| 2KJ9VT | X | 0.2343 | -0.0341 | -5.06 | 0.2497 | -0.0351 | -5.11 | OE |
| 2M68YP | * | 0.2659 | -0.0025 | -0.38 | 0.2907 | 0.0059 | 0.86 | OE |
| 3JHXDV | | 0.2651 | -0.0033 | -0.50 | 0.2793 | -0.0055 | -0.80 | OE |
| 3KDPZ2 | | 0.2673 | -0.0011 | -0.17 | 0.2843 | -0.0005 | -0.07 | WD |
| 3RC47W | * | 0.2530 | -0.0155 | -2.29 | 0.2763 | -0.0085 | -1.23 | OE |
| 4434EQ | | 0.2640 | -0.0045 | -0.66 | 0.2810 | -0.0038 | -0.55 | OE |
| 46C9RE | | 0.2650 | -0.0035 | -0.51 | 0.2800 | -0.0048 | -0.70 | OE |
| 4XEJBA | | 0.2730 | 0.0045 | 0.67 | 0.2880 | 0.0032 | 0.46 | OE |
| 4YBU7D | | 0.2757 | 0.0072 | 1.07 | 0.2927 | 0.0079 | 1.14 | OE |
| 629VJF | | 0.2713 | 0.0029 | 0.43 | 0.2827 | -0.0021 | -0.31 | OE |
| 6MPCPQ | X | 0.2503 | -0.0181 | -2.69 | 0.2627 | -0.0221 | -3.22 | XX |
| 73XQG8 | X | 0.2915 | 0.0230 | 3.42 | 0.3049 | 0.0201 | 2.92 | IC |
| 7LFM28 | | 0.2779 | 0.0095 | 1.40 | 0.2953 | 0.0105 | 1.53 | AE |
| 7Q4AR7 | | 0.2697 | 0.0012 | 0.18 | 0.2863 | 0.0015 | 0.22 | OE |
| 7WUJ36 | | 0.2691 | 0.0007 | 0.10 | 0.2834 | -0.0014 | -0.21 | OE |
| 86HURQ | | 0.2700 | 0.0016 | 0.23 | 0.2869 | 0.0021 | 0.30 | IC |
| 8G3ZAN | | 0.2810 | 0.0125 | 1.86 | 0.3013 | 0.0165 | 2.41 | OE |
| 962X2C | | 0.2830 | 0.0145 | 2.16 | 0.2983 | 0.0135 | 1.97 | OE |
| 99VYYK | | 0.2715 | 0.0031 | 0.46 | 0.2930 | 0.0082 | 1.19 | IC |
| 9DV7L3 | | 0.2590 | -0.0095 | -1.40 | 0.2740 | -0.0108 | -1.58 | XX |
| 9GUGFH | | 0.2752 | 0.0067 | 0.99 | 0.2923 | 0.0075 | 1.09 | OE |
| 9JKHL6 | | 0.2710 | 0.0025 | 0.38 | 0.2900 | 0.0052 | 0.76 | OE |
| 9L4TGN | | 0.2663 | -0.0021 | -0.32 | 0.2837 | -0.0011 | -0.17 | OE |
| 9NU2FR | | 0.2663 | -0.0021 | -0.32 | 0.2827 | -0.0021 | -0.31 | OE |
| 9RB4R4 | | 0.2680 | -0.0005 | -0.07 | 0.2833 | -0.0015 | -0.21 | OE |
| 9UL26L | | 0.2680 | -0.0005 | -0.07 | 0.2833 | -0.0015 | -0.21 | AE |
| A2XP8L | | 0.2733 | 0.0049 | 0.72 | 0.2890 | 0.0042 | 0.61 | AE |
| C3YA9Q | | 0.2663 | -0.0021 | -0.32 | 0.2843 | -0.0005 | -0.07 | IC |
| C3YELE | | 0.2563 | -0.0121 | -1.80 | 0.2733 | -0.0115 | -1.67 | OE |
| CBD7YJ | | 0.2637 | -0.0048 | -0.71 | 0.2800 | -0.0048 | -0.70 | IC |
| CEA2FX | | 0.2658 | -0.0027 | -0.39 | 0.2838 | -0.0010 | -0.15 | OE |
| CEYZUY | | 0.2577 | -0.0108 | -1.60 | 0.2733 | -0.0115 | -1.67 | XX |
| CGY9X9 | | 0.2566 | -0.0119 | -1.76 | 0.2751 | -0.0097 | -1.42 | OE |
| CHXDE3 | | 0.2740 | 0.0055 | 0.82 | 0.2913 | 0.0065 | 0.95 | OE |
| CTVAJP | | 0.2713 | 0.0029 | 0.43 | 0.2827 | -0.0021 | -0.31 | OE |
| CU8QW4 | | 0.2647 | -0.0038 | -0.56 | 0.2813 | -0.0035 | -0.51 | GD |
| D7E2XY | | 0.2703 | 0.0019 | 0.28 | 0.2797 | -0.0051 | -0.75 | OE |
| D7YZUW | | 0.2670 | -0.0015 | -0.22 | 0.2830 | -0.0018 | -0.26 | OE |
| D9N7C9 | X | 0.2447 | -0.0238 | -3.52 | 0.2543 | -0.0305 | -4.44 | OE |
| DH7RFG | | 0.2673 | -0.0011 | -0.17 | 0.2857 | 0.0009 | 0.13 | IC |
| DJJEVB | | 0.2731 | 0.0047 | 0.69 | 0.2874 | 0.0026 | 0.38 | XX |
| DKGRGH | | 0.2613 | -0.0071 | -1.06 | 0.2760 | -0.0088 | -1.28 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1604

Carbon & Low Alloy Steel, SILICON (Si)
SILICON (Si)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DLALF8 | | 0.2570 | -0.0115 | -1.70 | 0.2703 | -0.0145 | -2.11 | OE |
| DNF4E3 | | 0.2698 | 0.0013 | 0.19 | 0.2818 | -0.0030 | -0.44 | OE |
| DT9842 | * | 0.2823 | 0.0139 | 2.06 | 0.2920 | 0.0072 | 1.05 | OE |
| DWVPLL | | 0.2663 | -0.0021 | -0.32 | 0.2817 | -0.0031 | -0.46 | OE |
| EK984Y | | 0.2717 | 0.0032 | 0.48 | 0.2907 | 0.0059 | 0.85 | OE |
| EXW8Y8 | X | 0.2643 | -0.0041 | -0.61 | 0.2633 | -0.0215 | -3.13 | OE |
| EYTPYN | | 0.2701 | 0.0016 | 0.24 | 0.2865 | 0.0017 | 0.25 | OE |
| F6GPUU | | 0.2693 | 0.0008 | 0.12 | 0.2838 | -0.0010 | -0.15 | OE |
| F7QPWG | X | 0.2900 | 0.0215 | 3.19 | 0.3100 | 0.0252 | 3.67 | GD |
| F8HXWJ | | 0.2779 | 0.0095 | 1.40 | 0.2947 | 0.0099 | 1.44 | OE |
| FA84EV | | 0.2613 | -0.0071 | -1.06 | 0.2770 | -0.0078 | -1.14 | OE |
| FCCRW7 | | 0.2796 | 0.0112 | 1.66 | 0.2968 | 0.0120 | 1.74 | OE |
| FEZ4VC | | 0.2657 | -0.0028 | -0.41 | 0.2807 | -0.0041 | -0.60 | OE |
| FFVMWD | | 0.2650 | -0.0035 | -0.51 | 0.2840 | -0.0008 | -0.12 | OE |
| FPMXBE | | 0.2832 | 0.0147 | 2.19 | 0.3015 | 0.0167 | 2.43 | OE |
| FTHWGX | | 0.2574 | -0.0111 | -1.64 | 0.2738 | -0.0111 | -1.61 | OE |
| G4JUQJ | | 0.2593 | -0.0091 | -1.35 | 0.2743 | -0.0105 | -1.52 | AE |
| GY7VD4 | | 0.2727 | 0.0042 | 0.62 | 0.2877 | 0.0029 | 0.42 | OE |
| H7K4CK | | 0.2640 | -0.0045 | -0.66 | 0.2830 | -0.0018 | -0.26 | OE |
| HBFPNG | | 0.2700 | 0.0015 | 0.23 | 0.2900 | 0.0052 | 0.76 | OE |
| HHEK2L | | 0.2607 | -0.0078 | -1.16 | 0.2740 | -0.0108 | -1.57 | CL |
| HJ4QGC | | 0.2756 | 0.0072 | 1.06 | 0.2856 | 0.0008 | 0.12 | OE |
| HRF2TC | X | 0.2887 | 0.0202 | 3.00 | 0.3087 | 0.0239 | 3.47 | OE |
| J3FQAD | | 0.2580 | -0.0105 | -1.55 | 0.2753 | -0.0095 | -1.38 | OE |
| J4BEN3 | | 0.2670 | -0.0015 | -0.22 | 0.2837 | -0.0011 | -0.17 | OE |
| J94HFK | | 0.2697 | 0.0012 | 0.18 | 0.2863 | 0.0015 | 0.22 | OE |
| JVFECV | | 0.2542 | -0.0142 | -2.11 | 0.2738 | -0.0110 | -1.61 | OE |
| K3TPYU | | 0.2655 | -0.0030 | -0.44 | 0.2831 | -0.0017 | -0.25 | OE |
| K4P697 | | 0.2680 | -0.0005 | -0.07 | 0.2837 | -0.0011 | -0.17 | OE |
| KJMALA | | 0.2697 | 0.0012 | 0.18 | 0.2863 | 0.0015 | 0.22 | OE |
| KNT624 | | 0.2755 | 0.0070 | 1.04 | 0.2930 | 0.0082 | 1.19 | OE |
| KU4YHU | | 0.2763 | 0.0079 | 1.17 | 0.2953 | 0.0105 | 1.53 | XX |
| LCKF89 | | 0.2637 | -0.0048 | -0.71 | 0.2800 | -0.0048 | -0.70 | XX |
| LHLYY7 | | 0.2750 | 0.0065 | 0.97 | 0.2903 | 0.0055 | 0.80 | OE |
| LYWBVC | | 0.2683 | -0.0001 | -0.02 | 0.2870 | 0.0022 | 0.32 | OE |
| MTXLKC | | 0.2622 | -0.0063 | -0.93 | 0.2789 | -0.0059 | -0.85 | OE |
| MYL9FG | | 0.2687 | 0.0002 | 0.03 | 0.2840 | -0.0008 | -0.12 | OE |
| NDG3C9 | | 0.2673 | -0.0011 | -0.17 | 0.2867 | 0.0019 | 0.27 | OE |
| NEBXTP | | 0.2621 | -0.0063 | -0.94 | 0.2820 | -0.0028 | -0.41 | XX |
| NGYARV | X | 0.2914 | 0.0229 | 3.40 | 0.3068 | 0.0220 | 3.20 | DR |
| NJ6RQQ | * | 0.2877 | 0.0192 | 2.85 | 0.3047 | 0.0199 | 2.89 | XX |
| NNXVVD | | 0.2796 | 0.0111 | 1.65 | 0.2955 | 0.0107 | 1.56 | OE |
| NPC426 | | 0.2657 | -0.0028 | -0.41 | 0.2823 | -0.0025 | -0.36 | OE |
| NRJAQD | | 0.2630 | -0.0055 | -0.81 | 0.2797 | -0.0051 | -0.75 | OE |
| P2PLEU | | 0.2664 | -0.0021 | -0.31 | 0.2810 | -0.0038 | -0.55 | OE |
| P4QQRE | | 0.2587 | -0.0098 | -1.45 | 0.2720 | -0.0128 | -1.86 | IC |
| P7ZW8N | * | 0.2671 | -0.0013 | -0.20 | 0.2713 | -0.0135 | -1.97 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1604

Carbon & Low Alloy Steel, SILICON (Si)
SILICON (Si)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PBUNLD | X | 0.2863 | 0.0179 | 2.65 | 0.3083 | 0.0235 | 3.42 | OE |
| PDLKB8 | | 0.2660 | -0.0025 | -0.37 | 0.2813 | -0.0035 | -0.51 | OE |
| PQ4G6A | | 0.2654 | -0.0031 | -0.46 | 0.2817 | -0.0031 | -0.45 | OE |
| PQJZP8 | X | 0.2567 | -0.0118 | -1.75 | 0.2830 | -0.0018 | -0.26 | GR |
| PRX8BN | | 0.2738 | 0.0054 | 0.80 | 0.2916 | 0.0068 | 0.99 | OE |
| Q9GFPX | | 0.2667 | -0.0018 | -0.27 | 0.2830 | -0.0018 | -0.26 | OE |
| QRWPTJ | | 0.2797 | 0.0112 | 1.66 | 0.2990 | 0.0142 | 2.07 | GD |
| QT3ET8 | | 0.2720 | 0.0035 | 0.52 | 0.2870 | 0.0022 | 0.32 | GD |
| R8F3HV | X | 0.2590 | -0.0095 | -1.40 | 0.2657 | -0.0191 | -2.79 | IC |
| RA9VEZ | | 0.2657 | -0.0028 | -0.41 | 0.2833 | -0.0015 | -0.21 | OE |
| RHNHN4 | | 0.2549 | -0.0136 | -2.01 | 0.2758 | -0.0090 | -1.31 | OE |
| RZJ8HC | | 0.2691 | 0.0006 | 0.09 | 0.2858 | 0.0010 | 0.15 | OE |
| T68AZ3 | X | 0.2370 | -0.0315 | -4.67 | 0.2630 | -0.0218 | -3.17 | IC |
| T7QXM3 | | 0.2651 | -0.0033 | -0.49 | 0.2821 | -0.0027 | -0.39 | OE |
| T8HUAC | | 0.2667 | -0.0018 | -0.27 | 0.2831 | -0.0017 | -0.24 | IC |
| T8Z3ZR | | 0.2677 | -0.0008 | -0.12 | 0.2850 | 0.0002 | 0.03 | IC |
| TZJHYZ | * | 0.2700 | 0.0015 | 0.23 | 0.2730 | -0.0118 | -1.72 | OE |
| U3LRHG | | 0.2750 | 0.0065 | 0.97 | 0.2900 | 0.0052 | 0.76 | OE |
| UJ96YU | | 0.2620 | -0.0065 | -0.96 | 0.2753 | -0.0095 | -1.38 | XX |
| UN4W8R | | 0.2737 | 0.0052 | 0.77 | 0.2877 | 0.0029 | 0.42 | XX |
| UPDZ23 | | 0.2631 | -0.0054 | -0.80 | 0.2837 | -0.0011 | -0.16 | OE |
| V4BFHN | | 0.2720 | 0.0035 | 0.52 | 0.2887 | 0.0039 | 0.56 | XX |
| VDCZHV | | 0.2680 | -0.0005 | -0.07 | 0.2876 | 0.0028 | 0.41 | GR |
| VM2NDX | * | 0.2743 | 0.0059 | 0.87 | 0.2823 | -0.0025 | -0.36 | OE |
| VU3W4Y | | 0.2713 | 0.0029 | 0.43 | 0.2857 | 0.0009 | 0.13 | OE |
| VU6QHX | | 0.2711 | 0.0026 | 0.38 | 0.2831 | -0.0017 | -0.25 | OE |
| VWVTQ8 | | 0.2783 | 0.0099 | 1.46 | 0.2910 | 0.0062 | 0.90 | IC |
| VYXQ2Z | | 0.2783 | 0.0099 | 1.46 | 0.2937 | 0.0089 | 1.29 | OE |
| W9XMCG | | 0.2657 | -0.0028 | -0.41 | 0.2850 | 0.0002 | 0.03 | IC |
| WB4822 | | 0.2641 | -0.0044 | -0.65 | 0.2776 | -0.0072 | -1.05 | IC |
| WPNM8M | | 0.2660 | -0.0025 | -0.37 | 0.2857 | 0.0009 | 0.13 | AE |
| WRDR4Z | | 0.2597 | -0.0088 | -1.30 | 0.2753 | -0.0095 | -1.38 | OE |
| WVEXGK | | 0.2724 | 0.0039 | 0.58 | 0.2876 | 0.0028 | 0.40 | OE |
| X366CV | | 0.2714 | 0.0029 | 0.43 | 0.2888 | 0.0040 | 0.58 | OE |
| XD7BMW | | 0.2687 | 0.0002 | 0.03 | 0.2843 | -0.0005 | -0.07 | XX |
| XL29E7 | | 0.2657 | -0.0028 | -0.41 | 0.2820 | -0.0028 | -0.41 | OE |
| YDNUV2 | | 0.2637 | -0.0048 | -0.71 | 0.2803 | -0.0045 | -0.65 | OE |
| YHF7LQ | | 0.2707 | 0.0022 | 0.33 | 0.2863 | 0.0015 | 0.22 | DR |
| YPJTYZ | | 0.2577 | -0.0108 | -1.60 | 0.2777 | -0.0071 | -1.04 | OE |
| YQURVU | | 0.2643 | -0.0041 | -0.61 | 0.2787 | -0.0061 | -0.89 | IC |
| YWGHP | | 0.2870 | 0.0185 | 2.75 | 0.3017 | 0.0169 | 2.45 | XX |
| YZFTDP | | 0.2767 | 0.0082 | 1.22 | 0.2890 | 0.0042 | 0.61 | IC |
| ZC78RC | | 0.2700 | 0.0015 | 0.23 | 0.2883 | 0.0035 | 0.51 | GD |
| ZD2N8V | | 0.2696 | 0.0011 | 0.16 | 0.2840 | -0.0008 | -0.12 | OE |
| ZM9KVX | | 0.2760 | 0.0075 | 1.12 | 0.2930 | 0.0082 | 1.19 | OE |
| ZRKBCL | | 0.2728 | 0.0043 | 0.64 | 0.2852 | 0.0004 | 0.05 | OE |
| ZYLHZ3 | | 0.2630 | -0.0055 | -0.81 | 0.2807 | -0.0041 | -0.60 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1604

Carbon & Low Alloy Steel, SILICON (Si)
SILICON (Si)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.2685 | Percent | 0.2848 | Percent |
| Std Dev Btwn Labs | 0.0067 | Percent | 0.0069 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 122 of 141 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1604

- 2KJ9VT (X) - Data for both samples are low. Possible Systematic Error.
- 6MPCPQ (X) - Data for sample L70 are low.
- 73XQG8 (X) - Data for both samples are high. Possible Systematic Error.
- D9N7C9 (X) - Data for both samples are low. Possible Systematic Error.
- EXW8Y8 (X) - Data for sample L70 are low.
- F7QPWG (X) - Data for both samples are high. Possible Systematic Error.
- HRF2TC (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- NGYARV (X) - Data for both samples are high. Possible Systematic Error.
- PBUNLD (X) - Data for sample L70 are high.
- PQJZP8 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- R8F3HV (X) - Data for sample L70 are low.
- T68AZ3 (X) - Data for both samples are low. Possible Systematic Error.

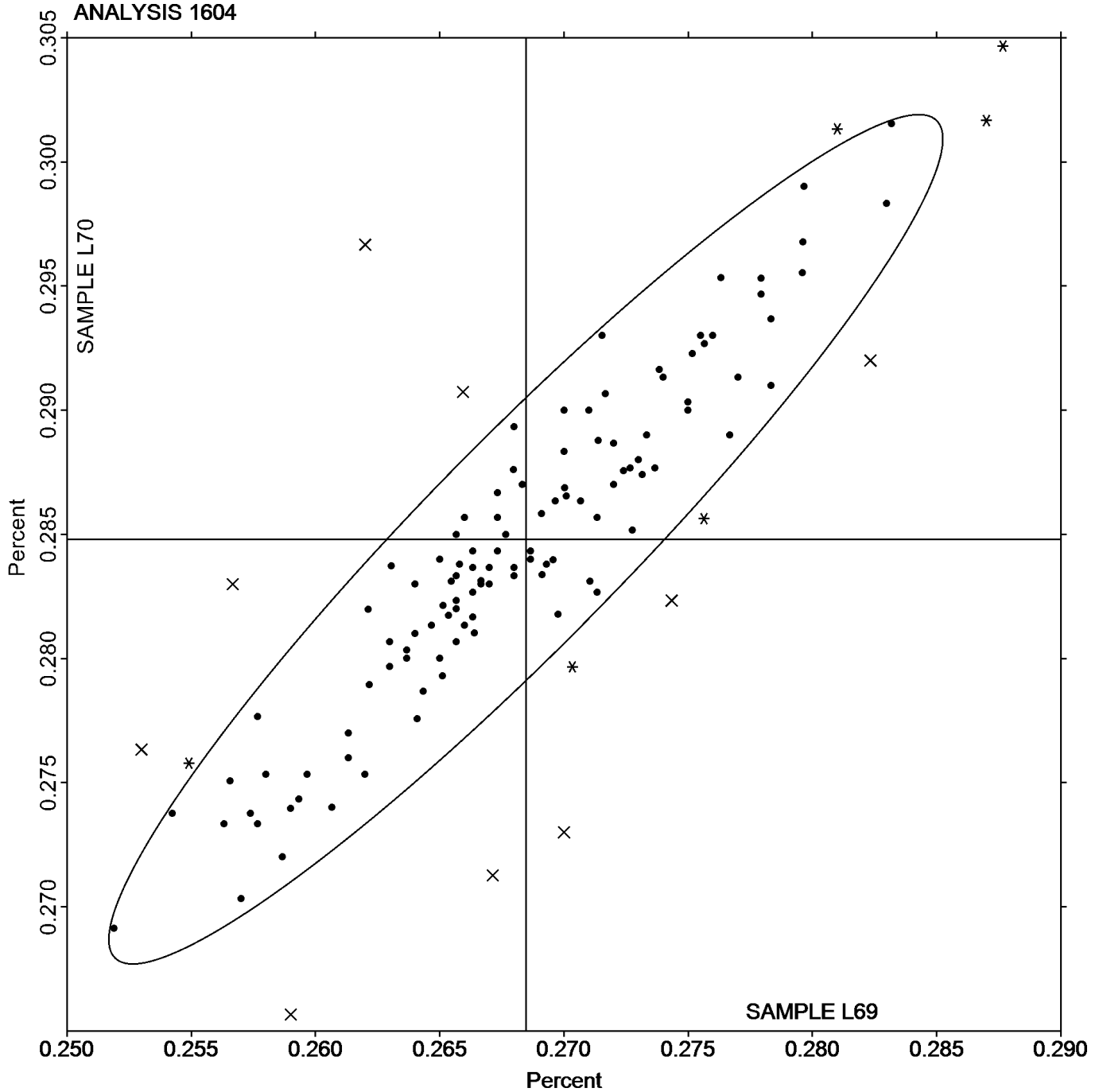


Analysis 1604

Carbon & Low Alloy Steel, SILICON (Si)
SILICON (Si)

SAMPLE L69
0.2685 Percent

SAMPLE L70
0.2848 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1605

Carbon & Low Alloy Steel, MOLYBDENUM (Mo)
MOLYBDENUM (Mo)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | | 0.0279 | -0.0022 | -1.59 | 0.0307 | -0.0017 | -1.17 | OE |
| 2GKXZT | | 0.0311 | 0.0010 | 0.76 | 0.0332 | 0.0008 | 0.54 | OE |
| 2HRC8Y | | 0.0304 | 0.0003 | 0.25 | 0.0329 | 0.0005 | 0.35 | GD |
| 2J6V3P | X | 0.0347 | 0.0047 | 3.42 | 0.0363 | 0.0039 | 2.74 | OE |
| 2KE2HY | | 0.0320 | 0.0019 | 1.42 | 0.0340 | 0.0016 | 1.12 | OE |
| 2KJ9VT | | 0.0310 | 0.0009 | 0.69 | 0.0337 | 0.0013 | 0.89 | OE |
| 2M68YP | | 0.0301 | 0.0000 | 0.01 | 0.0327 | 0.0003 | 0.19 | OE |
| 3JHXDV | | 0.0295 | -0.0006 | -0.40 | 0.0321 | -0.0003 | -0.24 | OE |
| 3KDPZ2 | | 0.0305 | 0.0004 | 0.30 | 0.0329 | 0.0005 | 0.33 | WD |
| 3RC47W | X | 0.0333 | 0.0033 | 2.39 | 0.0370 | 0.0046 | 3.23 | OE |
| 4434EQ | | 0.0304 | 0.0003 | 0.23 | 0.0331 | 0.0007 | 0.49 | OE |
| 46C9RE | | 0.0294 | -0.0007 | -0.48 | 0.0321 | -0.0003 | -0.19 | OE |
| 4CDPZY | | 0.0306 | 0.0005 | 0.38 | 0.0325 | 0.0001 | 0.09 | XX |
| 4XEJBA | | 0.0297 | -0.0004 | -0.28 | 0.0320 | -0.0004 | -0.28 | OE |
| 4YBU7D | X | 0.0423 | 0.0122 | 8.91 | 0.0430 | 0.0106 | 7.44 | OE |
| 629VJF | | 0.0307 | 0.0006 | 0.45 | 0.0327 | 0.0003 | 0.19 | OE |
| 6MPCPQ | * | 0.0260 | -0.0041 | -2.96 | 0.0283 | -0.0041 | -2.85 | XX |
| 73XQG8 | | 0.0285 | -0.0016 | -1.16 | 0.0306 | -0.0018 | -1.26 | IC |
| 7LFM28 | | 0.0309 | 0.0008 | 0.59 | 0.0334 | 0.0010 | 0.73 | AE |
| 7Q4AR7 | | 0.0305 | 0.0004 | 0.30 | 0.0328 | 0.0004 | 0.28 | OE |
| 7WUJ36 | | 0.0291 | -0.0010 | -0.69 | 0.0312 | -0.0012 | -0.84 | OE |
| 86HURQ | | 0.0300 | -0.0001 | -0.06 | 0.0321 | -0.0003 | -0.19 | IC |
| 8G3ZAN | | 0.0297 | -0.0004 | -0.28 | 0.0320 | -0.0004 | -0.28 | OE |
| 962X2C | | 0.0332 | 0.0031 | 2.27 | 0.0351 | 0.0027 | 1.92 | OE |
| 99VYYK | * | 0.0330 | 0.0029 | 2.15 | 0.0349 | 0.0025 | 1.76 | IC |
| 9DV7L3 | | 0.0305 | 0.0004 | 0.33 | 0.0327 | 0.0003 | 0.21 | XX |
| 9GUGFH | | 0.0321 | 0.0020 | 1.47 | 0.0344 | 0.0020 | 1.40 | OE |
| 9JKHL6 | | 0.0321 | 0.0020 | 1.49 | 0.0347 | 0.0023 | 1.61 | OE |
| 9L4TGN | | 0.0307 | 0.0006 | 0.45 | 0.0330 | 0.0006 | 0.42 | OE |
| 9NU2FR | | 0.0310 | 0.0009 | 0.69 | 0.0330 | 0.0006 | 0.42 | OE |
| 9RB4R4 | | 0.0306 | 0.0005 | 0.40 | 0.0327 | 0.0003 | 0.21 | OE |
| 9UL26L | | 0.0294 | -0.0007 | -0.48 | 0.0316 | -0.0008 | -0.58 | AE |
| A2XP8L | | 0.0299 | -0.0001 | -0.09 | 0.0320 | -0.0004 | -0.28 | AE |
| AMFWLZ | X | 0.0250 | -0.0051 | -3.68 | 0.0300 | -0.0024 | -1.68 | AA |
| C3YA9Q | | 0.0307 | 0.0006 | 0.45 | 0.0330 | 0.0006 | 0.42 | IC |
| C3YELE | X | 0.0377 | 0.0076 | 5.58 | 0.0437 | 0.0113 | 7.91 | OE |
| CBD7YJ | | 0.0317 | 0.0017 | 1.23 | 0.0338 | 0.0014 | 1.01 | IC |
| CEA2FX | | 0.0304 | 0.0004 | 0.28 | 0.0328 | 0.0004 | 0.26 | OE |
| CEYZUY | | 0.0277 | -0.0024 | -1.74 | 0.0297 | -0.0027 | -1.92 | XX |
| CGY9X9 | | 0.0288 | -0.0012 | -0.89 | 0.0309 | -0.0015 | -1.05 | OE |
| CHXDE3 | * | 0.0307 | 0.0006 | 0.45 | 0.0353 | 0.0029 | 2.06 | OE |
| CTVAJP | | 0.0303 | 0.0003 | 0.21 | 0.0323 | -0.0001 | -0.05 | OE |
| CU8QW4 | | 0.0300 | -0.0001 | -0.04 | 0.0333 | 0.0009 | 0.66 | GD |
| D7E2XY | X | 0.0250 | -0.0051 | -3.68 | 0.0297 | -0.0027 | -1.92 | OE |
| D7YZUW | | 0.0290 | -0.0011 | -0.77 | 0.0320 | -0.0004 | -0.28 | OE |
| D9N7C9 | X | 0.0226 | -0.0074 | -5.41 | 0.0253 | -0.0071 | -5.00 | OE |
| DH7RFG | X | 0.0233 | -0.0067 | -4.90 | 0.0283 | -0.0041 | -2.85 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1605

Carbon & Low Alloy Steel, MOLYBDENUM (Mo)
MOLYBDENUM (Mo)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | | 0.0312 | 0.0012 | 0.85 | 0.0334 | 0.0010 | 0.70 | XX |
| DKGRGH | X | 0.0260 | -0.0041 | -2.96 | 0.0277 | -0.0047 | -3.32 | OE |
| DLALF8 | | 0.0297 | -0.0004 | -0.28 | 0.0320 | -0.0004 | -0.28 | OE |
| DNF4E3 | | 0.0295 | -0.0006 | -0.43 | 0.0314 | -0.0010 | -0.70 | OE |
| DWVPLL | | 0.0298 | -0.0002 | -0.16 | 0.0318 | -0.0006 | -0.40 | OE |
| EK984Y | | 0.0293 | -0.0008 | -0.55 | 0.0314 | -0.0010 | -0.68 | OE |
| EXW8Y8 | * | 0.0327 | 0.0026 | 1.91 | 0.0318 | -0.0006 | -0.42 | OE |
| EYTPYN | | 0.0303 | 0.0002 | 0.16 | 0.0325 | 0.0001 | 0.07 | OE |
| F6GPUU | | 0.0309 | 0.0008 | 0.62 | 0.0332 | 0.0008 | 0.59 | OE |
| F7QPWG | | 0.0300 | -0.0001 | -0.04 | 0.0327 | 0.0003 | 0.19 | GD |
| F8HXWJ | | 0.0285 | -0.0015 | -1.11 | 0.0307 | -0.0017 | -1.19 | OE |
| FA84EV | | 0.0307 | 0.0006 | 0.47 | 0.0330 | 0.0006 | 0.42 | OE |
| FCCRW7 | | 0.0297 | -0.0004 | -0.28 | 0.0320 | -0.0004 | -0.26 | OE |
| FEZ4VC | | 0.0304 | 0.0004 | 0.28 | 0.0323 | -0.0001 | -0.09 | OE |
| FFVMWD | | 0.0297 | -0.0004 | -0.28 | 0.0317 | -0.0007 | -0.51 | OE |
| FPMXBE | | 0.0307 | 0.0006 | 0.47 | 0.0327 | 0.0003 | 0.19 | OE |
| FTHWGX | | 0.0293 | -0.0007 | -0.53 | 0.0316 | -0.0008 | -0.57 | OE |
| G4JUQJ | | 0.0306 | 0.0005 | 0.38 | 0.0327 | 0.0003 | 0.21 | AE |
| GY7VD4 | | 0.0334 | 0.0033 | 2.42 | 0.0359 | 0.0035 | 2.43 | OE |
| HBFPNG | * | 0.0300 | -0.0001 | -0.04 | 0.0300 | -0.0024 | -1.68 | OE |
| HHEK2L | | 0.0289 | -0.0012 | -0.86 | 0.0317 | -0.0007 | -0.51 | IC |
| HJ4QGC | | 0.0302 | 0.0002 | 0.13 | 0.0321 | -0.0003 | -0.21 | OE |
| HRF2TC | | 0.0317 | 0.0017 | 1.23 | 0.0346 | 0.0022 | 1.57 | OE |
| J3FQAD | | 0.0273 | -0.0027 | -1.98 | 0.0300 | -0.0024 | -1.68 | OE |
| J4BEN3 | | 0.0312 | 0.0011 | 0.84 | 0.0338 | 0.0014 | 0.96 | OE |
| J94HFK | | 0.0288 | -0.0012 | -0.89 | 0.0314 | -0.0010 | -0.68 | OE |
| JVFECV | | 0.0266 | -0.0035 | -2.54 | 0.0293 | -0.0031 | -2.20 | OE |
| K3TPYU | | 0.0313 | 0.0012 | 0.91 | 0.0335 | 0.0011 | 0.75 | OE |
| K4P697 | | 0.0331 | 0.0030 | 2.22 | 0.0353 | 0.0029 | 2.01 | OE |
| KJMALA | | 0.0309 | 0.0009 | 0.64 | 0.0336 | 0.0012 | 0.82 | OE |
| KNT624 | | 0.0304 | 0.0004 | 0.28 | 0.0319 | -0.0005 | -0.33 | OE |
| KU4YHU | | 0.0303 | 0.0003 | 0.21 | 0.0330 | 0.0006 | 0.42 | XX |
| LCKF89 | | 0.0270 | -0.0031 | -2.25 | 0.0288 | -0.0036 | -2.50 | XX |
| LHLYY7 | | 0.0299 | -0.0001 | -0.09 | 0.0323 | -0.0001 | -0.09 | OE |
| LYWBYC | * | 0.0313 | 0.0012 | 0.89 | 0.0345 | 0.0021 | 1.47 | OE |
| MTXLKC | | 0.0317 | 0.0016 | 1.18 | 0.0349 | 0.0025 | 1.73 | WD |
| MYL9FG | X | 0.0287 | -0.0014 | -1.01 | 0.0323 | -0.0001 | -0.05 | OE |
| NDG3C9 | * | 0.0317 | 0.0016 | 1.18 | 0.0320 | -0.0004 | -0.28 | OE |
| NEBXTTP | | 0.0301 | 0.0001 | 0.06 | 0.0324 | 0.0000 | -0.02 | XX |
| NGYARV | | 0.0295 | -0.0006 | -0.43 | 0.0324 | 0.0000 | 0.00 | DR |
| NJ6RQQ | | 0.0303 | 0.0003 | 0.21 | 0.0330 | 0.0006 | 0.42 | XX |
| NNKXVD | | 0.0303 | 0.0002 | 0.16 | 0.0327 | 0.0003 | 0.23 | OE |
| NPC426 | | 0.0300 | -0.0001 | -0.04 | 0.0330 | 0.0006 | 0.40 | OE |
| NRJAQD | | 0.0289 | -0.0012 | -0.86 | 0.0313 | -0.0011 | -0.79 | OE |
| P2PLEU | | 0.0299 | -0.0002 | -0.13 | 0.0327 | 0.0003 | 0.23 | OE |
| P4QQRE | | 0.0291 | -0.0009 | -0.67 | 0.0313 | -0.0011 | -0.77 | IC |
| P7ZW8N | | 0.0321 | 0.0020 | 1.49 | 0.0343 | 0.0019 | 1.33 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1605

Carbon & Low Alloy Steel, MOLYBDENUM (Mo)
MOLYBDENUM (Mo)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PBUNLD | | 0.0312 | 0.0011 | 0.84 | 0.0339 | 0.0015 | 1.08 | OE |
| PDLKB8 | | 0.0270 | -0.0031 | -2.23 | 0.0290 | -0.0034 | -2.38 | OE |
| PQ4G6A | | 0.0309 | 0.0008 | 0.62 | 0.0333 | 0.0009 | 0.66 | OE |
| PQJZP8 | | 0.0293 | -0.0008 | -0.55 | 0.0320 | -0.0004 | -0.28 | IC |
| PRX8BN | | 0.0305 | 0.0005 | 0.35 | 0.0326 | 0.0002 | 0.12 | OE |
| Q9GFPX | | 0.0287 | -0.0014 | -1.01 | 0.0313 | -0.0011 | -0.75 | OE |
| QRWPTJ | | 0.0310 | 0.0009 | 0.69 | 0.0343 | 0.0019 | 1.36 | GD |
| QT3ET8 | | 0.0286 | -0.0015 | -1.06 | 0.0307 | -0.0017 | -1.19 | GD |
| R8F3HV | | 0.0304 | 0.0003 | 0.23 | 0.0324 | 0.0000 | -0.02 | IC |
| RA9VEZ | | 0.0300 | 0.0000 | -0.01 | 0.0325 | 0.0001 | 0.09 | OE |
| RHNHN4 | | 0.0279 | -0.0022 | -1.58 | 0.0302 | -0.0022 | -1.54 | OE |
| RZJ8HC | | 0.0302 | 0.0001 | 0.11 | 0.0323 | -0.0001 | -0.09 | OE |
| T68AZ3 | | 0.0290 | -0.0011 | -0.77 | 0.0310 | -0.0014 | -0.98 | IC |
| T7QXM3 | | 0.0297 | -0.0004 | -0.26 | 0.0317 | -0.0007 | -0.51 | OE |
| T8HUAC | | 0.0308 | 0.0007 | 0.55 | 0.0330 | 0.0006 | 0.42 | IC |
| T8Z3ZR | X | 0.0287 | -0.0014 | -1.01 | 0.0323 | -0.0001 | -0.05 | IC |
| TZJHYZ | * | 0.0260 | -0.0041 | -2.96 | 0.0280 | -0.0044 | -3.09 | OE |
| U3LRHG | | 0.0320 | 0.0019 | 1.42 | 0.0340 | 0.0016 | 1.12 | OE |
| UJ96YU | | 0.0290 | -0.0011 | -0.77 | 0.0310 | -0.0014 | -0.98 | XX |
| UN4W8R | | 0.0277 | -0.0023 | -1.69 | 0.0295 | -0.0029 | -2.06 | IC |
| UPDZ23 | | 0.0292 | -0.0009 | -0.65 | 0.0318 | -0.0006 | -0.42 | OE |
| V4BFHN | X | 0.0350 | 0.0049 | 3.61 | 0.0393 | 0.0069 | 4.87 | XX |
| VDCZHV | | 0.0302 | 0.0001 | 0.08 | 0.0322 | -0.0002 | -0.16 | IC |
| VM2NDX | * | 0.0302 | 0.0001 | 0.08 | 0.0307 | -0.0017 | -1.17 | OE |
| VU3W4Y | | 0.0310 | 0.0009 | 0.69 | 0.0330 | 0.0006 | 0.42 | OE |
| VWVTQ8 | | 0.0303 | 0.0003 | 0.21 | 0.0327 | 0.0003 | 0.19 | XX |
| VYXQ2Z | | 0.0311 | 0.0011 | 0.79 | 0.0337 | 0.0013 | 0.89 | OE |
| W9XMCG | | 0.0300 | -0.0001 | -0.04 | 0.0323 | -0.0001 | -0.09 | IC |
| WB4822 | | 0.0301 | 0.0000 | 0.01 | 0.0322 | -0.0002 | -0.12 | IC |
| WPNM8M | | 0.0307 | 0.0006 | 0.45 | 0.0329 | 0.0005 | 0.38 | AE |
| WRDR4Z | | 0.0305 | 0.0005 | 0.35 | 0.0330 | 0.0006 | 0.42 | OE |
| WVEXGK | | 0.0294 | -0.0007 | -0.50 | 0.0324 | 0.0000 | 0.02 | OE |
| X366CV | | 0.0305 | 0.0005 | 0.35 | 0.0326 | 0.0002 | 0.16 | OE |
| XD7BMW | | 0.0300 | -0.0001 | -0.04 | 0.0323 | -0.0001 | -0.05 | XX |
| XL29E7 | | 0.0290 | -0.0011 | -0.77 | 0.0320 | -0.0004 | -0.28 | OE |
| YDNUV2 | | 0.0312 | 0.0011 | 0.84 | 0.0338 | 0.0014 | 0.96 | OE |
| YPJTYZ | * | 0.0307 | 0.0006 | 0.45 | 0.0310 | -0.0014 | -0.98 | OE |
| YQURVU | | 0.0305 | 0.0005 | 0.35 | 0.0328 | 0.0004 | 0.28 | IC |
| YWGHP | | 0.0317 | 0.0016 | 1.18 | 0.0343 | 0.0019 | 1.36 | XX |
| YZFTDP | | 0.0298 | -0.0003 | -0.18 | 0.0321 | -0.0003 | -0.23 | IC |
| ZC78RC | | 0.0323 | 0.0023 | 1.66 | 0.0350 | 0.0026 | 1.83 | GD |
| ZD2N8V | | 0.0304 | 0.0003 | 0.23 | 0.0326 | 0.0002 | 0.13 | OE |
| ZHURVT | X | 0.0350 | 0.0049 | 3.61 | 0.0343 | 0.0019 | 1.36 | XR |
| ZM9KVX | | 0.0289 | -0.0012 | -0.84 | 0.0308 | -0.0016 | -1.10 | OE |
| ZRKBC | | 0.0277 | -0.0024 | -1.72 | 0.0302 | -0.0022 | -1.57 | OE |
| ZYLHZ3 | | 0.0287 | -0.0014 | -1.01 | 0.0313 | -0.0011 | -0.75 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1605

Carbon & Low Alloy Steel, MOLYBDENUM (Mo)
MOLYBDENUM (Mo)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.0301 | Percent | 0.0324 | Percent |
| Std Dev Btwn Labs | 0.0014 | Percent | 0.0014 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 121 of 140 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1605

- 2J6V3P (X) - Data for sample L69 are high.
- 3RC47W (X) - Data for sample L70 are high. Inconsistent within the determinations of both samples.
- 4YBU7D (X) - Data for both samples are high. Possible Systematic Error.
- AMFWLZ (X) - Data for sample L69 are low. Inconsistent within the determinations of sample L69.
- C3YELE (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L69.
- D7E2XY (X) - Data for sample L69 are low. Inconsistent within the determinations of both samples.
- D9N7C9 (X) - Data for both samples are low. Possible Systematic Error.
- DH7RFG (X) - Data for both samples are low. Possible Systematic Error. Inconsistent within the determinations of both samples.
- DKGRGH (X) - Data for both samples are low. Possible Systematic Error.
- MYL9FG (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- T8Z3ZR (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L69.
- V4BFHN (X) - Data for both samples are high. Possible Systematic Error.
- ZHURVT (X) - Data for sample L69 are high. Inconsistent within the determinations of both samples.

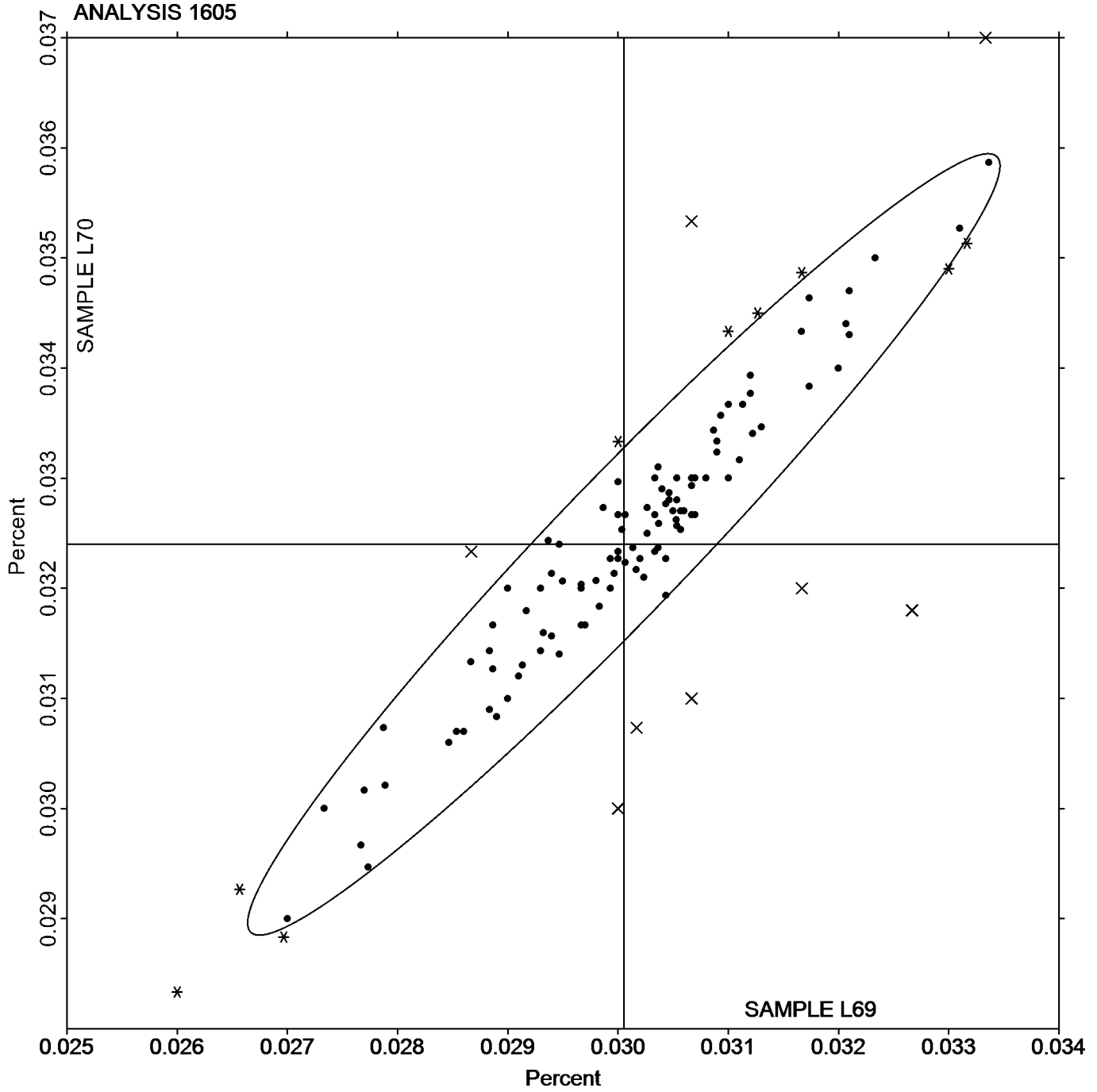


Analysis 1605

Carbon & Low Alloy Steel, MOLYBDENUM (Mo)
MOLYBDENUM (Mo)

SAMPLE L69
0.0301 Percent

SAMPLE L70
0.0324 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1606

Carbon & Low Alloy Steel, NICKEL (Ni)
NICKEL (Ni)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | X | 0.0893 | -0.0114 | -3.72 | 0.0780 | -0.0097 | -3.45 | OE |
| 2GKXZT | | 0.0981 | -0.0026 | -0.86 | 0.0849 | -0.0028 | -0.99 | OE |
| 2HRC8Y | X | 0.1003 | -0.0004 | -0.12 | 0.0903 | 0.0026 | 0.94 | GD |
| 2J6V3P | | 0.1013 | 0.0006 | 0.21 | 0.0897 | 0.0020 | 0.70 | OE |
| 2KE2HY | | 0.1000 | -0.0007 | -0.22 | 0.0883 | 0.0006 | 0.23 | OE |
| 2KJ9VT | | 0.0983 | -0.0024 | -0.77 | 0.0863 | -0.0014 | -0.48 | XX |
| 2M68YP | | 0.0990 | -0.0017 | -0.56 | 0.0852 | -0.0025 | -0.87 | OE |
| 3JHXDV | | 0.1012 | 0.0005 | 0.17 | 0.0893 | 0.0016 | 0.56 | OE |
| 3KDPZ2 | | 0.0987 | -0.0020 | -0.66 | 0.0870 | -0.0007 | -0.24 | WD |
| 3RC47W | | 0.1060 | 0.0053 | 1.74 | 0.0927 | 0.0050 | 1.77 | OE |
| 4434EQ | X | 0.0913 | -0.0094 | -3.06 | 0.0830 | -0.0047 | -1.66 | OE |
| 46C9RE | | 0.1000 | -0.0007 | -0.22 | 0.0870 | -0.0007 | -0.24 | OE |
| 4CDPZY | | 0.1000 | -0.0007 | -0.24 | 0.0875 | -0.0002 | -0.07 | XX |
| 4XEJBA | | 0.1023 | 0.0016 | 0.54 | 0.0893 | 0.0016 | 0.59 | OE |
| 4YBU7D | | 0.0974 | -0.0033 | -1.09 | 0.0847 | -0.0030 | -1.05 | OE |
| 629VJF | | 0.1050 | 0.0043 | 1.41 | 0.0927 | 0.0050 | 1.77 | OE |
| 6MPCPQ | | 0.1053 | 0.0046 | 1.52 | 0.0937 | 0.0060 | 2.12 | XX |
| 73XQG8 | | 0.0958 | -0.0049 | -1.61 | 0.0812 | -0.0065 | -2.31 | IC |
| 7LFM28 | | 0.1003 | -0.0004 | -0.14 | 0.0869 | -0.0008 | -0.29 | AE |
| 7Q4AR7 | | 0.1003 | -0.0004 | -0.12 | 0.0870 | -0.0007 | -0.24 | OE |
| 7WUJ36 | | 0.1011 | 0.0004 | 0.13 | 0.0877 | 0.0000 | -0.01 | OE |
| 86HURQ | | 0.1011 | 0.0004 | 0.15 | 0.0884 | 0.0007 | 0.25 | IC |
| 8G3ZAN | | 0.1000 | -0.0007 | -0.22 | 0.0860 | -0.0017 | -0.60 | OE |
| 962X2C | | 0.1007 | 0.0000 | -0.01 | 0.0882 | 0.0005 | 0.17 | OE |
| 99VYYK | | 0.1050 | 0.0043 | 1.41 | 0.0912 | 0.0035 | 1.26 | IC |
| 9DV7L3 | | 0.1083 | 0.0076 | 2.48 | 0.0949 | 0.0072 | 2.55 | XX |
| 9GUGFH | | 0.1021 | 0.0014 | 0.46 | 0.0893 | 0.0016 | 0.56 | OE |
| 9JKHL6 | | 0.1050 | 0.0043 | 1.41 | 0.0910 | 0.0033 | 1.18 | OE |
| 9L4TGN | | 0.1010 | 0.0003 | 0.10 | 0.0860 | -0.0017 | -0.60 | OE |
| 9NU2FR | X | 0.1177 | 0.0170 | 5.55 | 0.1057 | 0.0180 | 6.38 | OE |
| 9RB4R4 | | 0.1002 | -0.0005 | -0.15 | 0.0870 | -0.0007 | -0.23 | OE |
| 9UL26L | | 0.0997 | -0.0010 | -0.33 | 0.0870 | -0.0007 | -0.24 | AE |
| A2XP8L | | 0.1020 | 0.0013 | 0.43 | 0.0880 | 0.0003 | 0.11 | AE |
| AMFWLZ | X | 0.0900 | -0.0107 | -3.49 | 0.0800 | -0.0077 | -2.73 | AA |
| C3YA9Q | | 0.0987 | -0.0020 | -0.66 | 0.0877 | 0.0000 | -0.01 | IC |
| C3YELE | X | 0.0910 | -0.0097 | -3.17 | 0.0843 | -0.0034 | -1.19 | OE |
| CBD7YJ | | 0.1023 | 0.0016 | 0.54 | 0.0887 | 0.0010 | 0.35 | IC |
| CEA2FX | | 0.1001 | -0.0006 | -0.18 | 0.0872 | -0.0005 | -0.18 | OE |
| CEYZUY | | 0.1043 | 0.0036 | 1.19 | 0.0920 | 0.0043 | 1.53 | XX |
| CGY9X9 | | 0.1023 | 0.0016 | 0.52 | 0.0888 | 0.0011 | 0.41 | OE |
| CHXDE3 | | 0.1000 | -0.0007 | -0.22 | 0.0863 | -0.0014 | -0.48 | OE |
| CTVAJP | | 0.1007 | 0.0000 | -0.01 | 0.0883 | 0.0006 | 0.23 | OE |
| CU8QW4 | | 0.1037 | 0.0030 | 0.97 | 0.0893 | 0.0016 | 0.59 | GD |
| D7E2XY | X | 0.1173 | 0.0166 | 5.44 | 0.1230 | 0.0353 | 12.54 | OE |
| D7YZUW | | 0.0987 | -0.0020 | -0.66 | 0.0873 | -0.0004 | -0.12 | OE |
| D9N7C9 | | 0.0990 | -0.0017 | -0.55 | 0.0871 | -0.0006 | -0.22 | OE |
| DH7RFG | | 0.0980 | -0.0027 | -0.88 | 0.0857 | -0.0020 | -0.72 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1606

Carbon & Low Alloy Steel, NICKEL (Ni)
NICKEL (Ni)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | * | 0.0967 | -0.0040 | -1.31 | 0.0878 | 0.0001 | 0.04 | XX |
| DKGRGH | | 0.0947 | -0.0060 | -1.97 | 0.0840 | -0.0037 | -1.31 | OE |
| DLALF8 | | 0.1027 | 0.0020 | 0.65 | 0.0893 | 0.0016 | 0.59 | OE |
| DNF4E3 | | 0.1001 | -0.0006 | -0.18 | 0.0877 | 0.0000 | 0.01 | OE |
| DT9842 | X | 0.0907 | -0.0100 | -3.27 | 0.0710 | -0.0167 | -5.92 | OE |
| DWVPLL | | 0.1032 | 0.0025 | 0.83 | 0.0897 | 0.0020 | 0.72 | OE |
| EK984Y | | 0.1014 | 0.0007 | 0.24 | 0.0882 | 0.0005 | 0.17 | OE |
| EXW8Y8 | * | 0.1003 | -0.0004 | -0.12 | 0.0835 | -0.0042 | -1.47 | OE |
| EYTPYN | | 0.1011 | 0.0004 | 0.12 | 0.0884 | 0.0007 | 0.25 | OE |
| F6GPUU | | 0.0970 | -0.0037 | -1.20 | 0.0848 | -0.0029 | -1.01 | OE |
| F7QPWG | | 0.0993 | -0.0014 | -0.44 | 0.0863 | -0.0014 | -0.48 | GD |
| F8HXWJ | | 0.1007 | 0.0000 | 0.00 | 0.0881 | 0.0004 | 0.14 | OE |
| FA84EV | | 0.1007 | 0.0000 | -0.01 | 0.0867 | -0.0010 | -0.36 | IC |
| FCCRW7 | | 0.1012 | 0.0005 | 0.18 | 0.0881 | 0.0004 | 0.14 | OE |
| FEZ4VC | | 0.1053 | 0.0046 | 1.52 | 0.0917 | 0.0040 | 1.41 | OE |
| FFVMWD | | 0.1007 | 0.0000 | -0.01 | 0.0870 | -0.0007 | -0.24 | OE |
| FPMXBE | | 0.1052 | 0.0045 | 1.46 | 0.0922 | 0.0045 | 1.62 | OE |
| FTHWGX | | 0.1081 | 0.0074 | 2.43 | 0.0948 | 0.0072 | 2.54 | OE |
| G4JUQJ | | 0.1013 | 0.0006 | 0.21 | 0.0867 | -0.0010 | -0.36 | AA |
| GY7VD4 | | 0.1010 | 0.0003 | 0.10 | 0.0880 | 0.0003 | 0.11 | OE |
| HBFPNG | | 0.1007 | 0.0000 | -0.01 | 0.0880 | 0.0003 | 0.11 | OE |
| HHEK2L | | 0.0983 | -0.0024 | -0.78 | 0.0849 | -0.0028 | -0.98 | IC |
| HJ4QGC | | 0.0977 | -0.0030 | -0.98 | 0.0855 | -0.0022 | -0.78 | OE |
| HRF2TC | | 0.1057 | 0.0050 | 1.63 | 0.0930 | 0.0053 | 1.90 | OE |
| J3FQAD | | 0.0990 | -0.0017 | -0.55 | 0.0863 | -0.0014 | -0.48 | OE |
| J4BEN3 | X | 0.1087 | 0.0080 | 2.61 | 0.0977 | 0.0100 | 3.54 | OE |
| J94HFK | | 0.0965 | -0.0042 | -1.36 | 0.0848 | -0.0029 | -1.01 | OE |
| JVFECV | | 0.1083 | 0.0076 | 2.50 | 0.0954 | 0.0077 | 2.75 | OE |
| K3TPYU | | 0.0992 | -0.0015 | -0.48 | 0.0867 | -0.0010 | -0.35 | OE |
| K4P697 | | 0.1014 | 0.0007 | 0.22 | 0.0872 | -0.0005 | -0.18 | OE |
| KJMALA | | 0.1033 | 0.0026 | 0.86 | 0.0896 | 0.0019 | 0.68 | OE |
| KNT624 | | 0.1016 | 0.0009 | 0.29 | 0.0867 | -0.0010 | -0.34 | OE |
| KU4YHU | | 0.0967 | -0.0040 | -1.31 | 0.0850 | -0.0027 | -0.95 | XX |
| LCKF89 | | 0.1090 | 0.0083 | 2.72 | 0.0952 | 0.0075 | 2.66 | XX |
| LHLYY7 | | 0.1030 | 0.0023 | 0.76 | 0.0902 | 0.0025 | 0.88 | OE |
| LYWBYC | | 0.0992 | -0.0015 | -0.50 | 0.0867 | -0.0010 | -0.34 | OE |
| MTXLKC | | 0.0993 | -0.0014 | -0.46 | 0.0882 | 0.0005 | 0.17 | WD |
| MYL9FG | | 0.0987 | -0.0020 | -0.66 | 0.0843 | -0.0034 | -1.19 | OE |
| NDG3C9 | | 0.0990 | -0.0017 | -0.55 | 0.0863 | -0.0014 | -0.48 | OE |
| NEBXTTP | | 0.1018 | 0.0011 | 0.36 | 0.0887 | 0.0010 | 0.36 | XX |
| NGYARV | | 0.1079 | 0.0072 | 2.35 | 0.0936 | 0.0059 | 2.11 | DR |
| NNKXVD | | 0.1023 | 0.0016 | 0.54 | 0.0892 | 0.0015 | 0.53 | OE |
| NPC426 | | 0.0993 | -0.0014 | -0.44 | 0.0890 | 0.0013 | 0.47 | OE |
| NRJAQD | | 0.0940 | -0.0067 | -2.19 | 0.0817 | -0.0060 | -2.14 | OE |
| P2PLEU | | 0.1002 | -0.0005 | -0.16 | 0.0871 | -0.0006 | -0.21 | OE |
| P4QQRE | | 0.0951 | -0.0056 | -1.84 | 0.0824 | -0.0053 | -1.86 | IC |
| P7ZW8N | * | 0.0993 | -0.0014 | -0.46 | 0.0805 | -0.0072 | -2.55 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1606

Carbon & Low Alloy Steel, NICKEL (Ni)
NICKEL (Ni)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PBUNLD | | 0.1027 | 0.0020 | 0.65 | 0.0898 | 0.0021 | 0.74 | OE |
| PDLKB8 | | 0.0963 | -0.0044 | -1.42 | 0.0840 | -0.0037 | -1.31 | OE |
| PQ4G6A | | 0.0993 | -0.0014 | -0.44 | 0.0870 | -0.0007 | -0.24 | OE |
| PQJZP8 | | 0.0972 | -0.0035 | -1.14 | 0.0859 | -0.0018 | -0.64 | IC |
| PRX8BN | | 0.0997 | -0.0010 | -0.33 | 0.0866 | -0.0011 | -0.40 | OE |
| Q9GFPX | | 0.1010 | 0.0003 | 0.10 | 0.0870 | -0.0007 | -0.24 | OE |
| QRWPTJ | | 0.1007 | 0.0000 | -0.01 | 0.0880 | 0.0003 | 0.11 | GD |
| QT3ET8 | * | 0.0959 | -0.0048 | -1.56 | 0.0807 | -0.0070 | -2.48 | GD |
| R8F3HV | | 0.1013 | 0.0006 | 0.21 | 0.0887 | 0.0010 | 0.35 | IC |
| RA9VEZ | | 0.1000 | -0.0007 | -0.22 | 0.0873 | -0.0004 | -0.12 | OE |
| RHNHN4 | | 0.0984 | -0.0023 | -0.76 | 0.0858 | -0.0019 | -0.66 | OE |
| RZJ8HC | | 0.1030 | 0.0023 | 0.77 | 0.0896 | 0.0019 | 0.67 | OE |
| T68AZ3 | | 0.1040 | 0.0033 | 1.08 | 0.0900 | 0.0023 | 0.82 | IC |
| T7QXM3 | | 0.1011 | 0.0004 | 0.12 | 0.0872 | -0.0005 | -0.16 | OE |
| T8HUAC | | 0.0972 | -0.0035 | -1.15 | 0.0854 | -0.0023 | -0.82 | IC |
| T8Z3ZR | X | 0.1023 | 0.0016 | 0.54 | 0.0863 | -0.0014 | -0.48 | IC |
| TZJHYZ | X | 0.1153 | 0.0146 | 4.79 | 0.0967 | 0.0090 | 3.19 | OE |
| U3LRHG | | 0.0930 | -0.0077 | -2.51 | 0.0800 | -0.0077 | -2.73 | OE |
| UJ96YU | | 0.1040 | 0.0033 | 1.08 | 0.0897 | 0.0020 | 0.70 | XX |
| UN4W8R | | 0.1007 | 0.0000 | -0.01 | 0.0867 | -0.0010 | -0.36 | IC |
| UPDZ23 | | 0.0980 | -0.0027 | -0.89 | 0.0843 | -0.0034 | -1.21 | OE |
| V4BFHN | * | 0.1047 | 0.0040 | 1.30 | 0.0890 | 0.0013 | 0.47 | XX |
| VDCZHV | | 0.0994 | -0.0013 | -0.41 | 0.0851 | -0.0026 | -0.93 | IC |
| VM2NDX | * | 0.1063 | 0.0056 | 1.85 | 0.0860 | -0.0017 | -0.60 | OE |
| VU3W4Y | | 0.1010 | 0.0003 | 0.10 | 0.0877 | 0.0000 | -0.01 | OE |
| VWVTQ8 | | 0.0947 | -0.0060 | -1.97 | 0.0820 | -0.0057 | -2.02 | IC |
| VYXQ2Z | | 0.0958 | -0.0049 | -1.60 | 0.0837 | -0.0040 | -1.43 | OE |
| W9XMCG | | 0.1007 | 0.0000 | -0.01 | 0.0870 | -0.0007 | -0.24 | IC |
| WB4822 | | 0.0999 | -0.0008 | -0.25 | 0.0862 | -0.0015 | -0.53 | XX |
| WPNM8M | | 0.1010 | 0.0003 | 0.10 | 0.0877 | 0.0000 | -0.01 | AE |
| WRDR4Z | | 0.1043 | 0.0036 | 1.19 | 0.0909 | 0.0032 | 1.14 | OE |
| WVEXGK | | 0.0987 | -0.0020 | -0.66 | 0.0860 | -0.0017 | -0.59 | OE |
| X366CV | | 0.1017 | 0.0010 | 0.33 | 0.0886 | 0.0010 | 0.34 | OE |
| XD7BMW | | 0.1007 | 0.0000 | -0.01 | 0.0883 | 0.0006 | 0.23 | XX |
| XL29E7 | | 0.1020 | 0.0013 | 0.43 | 0.0880 | 0.0003 | 0.11 | OE |
| YDNUV2 | | 0.1063 | 0.0056 | 1.85 | 0.0923 | 0.0046 | 1.65 | OE |
| YHF7LQ | | 0.0970 | -0.0037 | -1.20 | 0.0850 | -0.0027 | -0.95 | DR |
| YPJTYZ | | 0.1020 | 0.0013 | 0.43 | 0.0883 | 0.0006 | 0.23 | OE |
| YQURVU | * | 0.0923 | -0.0084 | -2.73 | 0.0843 | -0.0034 | -1.19 | IC |
| YWGHP | | 0.0983 | -0.0024 | -0.77 | 0.0867 | -0.0010 | -0.36 | XX |
| YZFTDP | | 0.0993 | -0.0014 | -0.44 | 0.0855 | -0.0022 | -0.78 | IC |
| ZC78RC | | 0.0960 | -0.0047 | -1.53 | 0.0827 | -0.0050 | -1.78 | GD |
| ZD2N8V | | 0.1022 | 0.0015 | 0.50 | 0.0879 | 0.0002 | 0.09 | OE |
| ZM9KVX | | 0.1003 | -0.0004 | -0.12 | 0.0870 | -0.0007 | -0.24 | OE |
| ZRKBC | | 0.0970 | -0.0037 | -1.20 | 0.0848 | -0.0029 | -1.04 | OE |
| ZYLHZ3 | | 0.1003 | -0.0004 | -0.12 | 0.0880 | 0.0003 | 0.11 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1606

Carbon & Low Alloy Steel, NICKEL (Ni)
NICKEL (Ni)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.1007 | Percent | 0.0877 | Percent |
| Std Dev Btwn Labs | 0.0031 | Percent | 0.0028 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 123 of 140 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1606

- 2AWLDB (X) - Data for both samples are low. Possible Systematic Error.
- 2HRC8Y (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L69.
- 4434EQ (X) - Data for sample L69 are low.
- 9NU2FR (X) - Data for both samples are high. Possible Systematic Error.
- AMFWLZ (X) - Data for sample L69 are low.
- C3YELE (X) - Data for sample L69 are low. Inconsistent within the determinations of both samples.
- D7E2XY (X) - Data for both samples are high. Possible Systematic Error.
- DT9842 (X) - Data for both samples are low. Possible Systematic Error.
- J4BEN3 (X) - Data for sample L70 are high. Inconsistent within the determinations of both samples.
- T8Z3ZR (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- TZJHYZ (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L70.

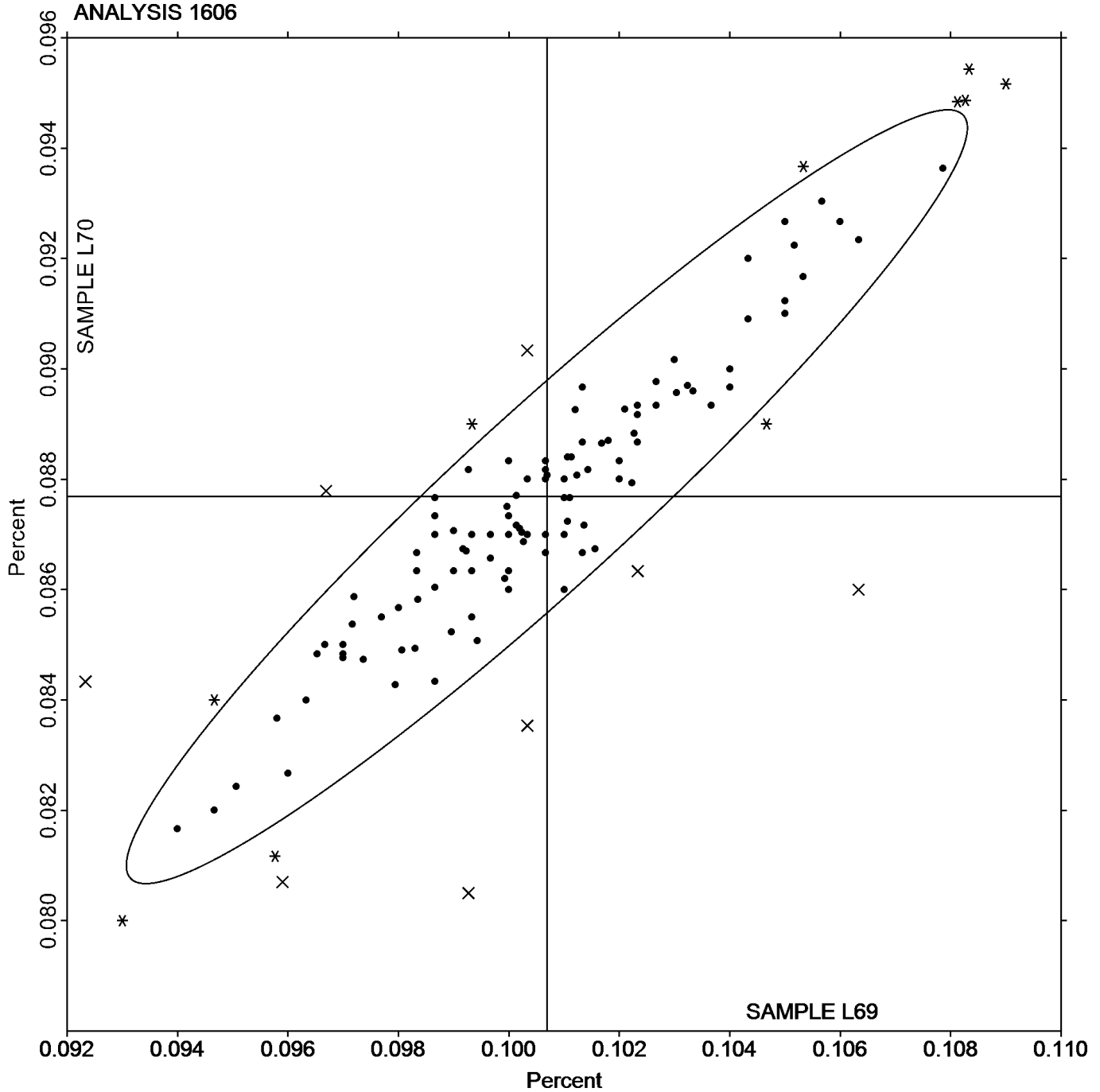


Analysis 1606

Carbon & Low Alloy Steel, NICKEL (Ni)
NICKEL (Ni)

SAMPLE L69
0.1007 Percent

SAMPLE L70
0.0877 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1607

Carbon & Low Alloy Steel, CHROMIUM (Cr)
CHROMIUM (Cr)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | X | 0.0658 | -0.0056 | -2.63 | 0.1153 | -0.0122 | -3.92 | OE |
| 2GKXZT | | 0.0710 | -0.0003 | -0.16 | 0.1280 | 0.0005 | 0.16 | OE |
| 2HRC8Y | | 0.0740 | 0.0027 | 1.26 | 0.1343 | 0.0068 | 2.19 | GD |
| 2J6V3P | | 0.0750 | 0.0037 | 1.73 | 0.1333 | 0.0058 | 1.87 | OE |
| 2KE2HY | X | 0.0703 | -0.0010 | -0.48 | 0.1400 | 0.0125 | 4.00 | OE |
| 2KJ9VT | | 0.0697 | -0.0017 | -0.79 | 0.1237 | -0.0038 | -1.23 | OE |
| 2M68YP | | 0.0713 | 0.0000 | -0.02 | 0.1285 | 0.0010 | 0.33 | XX |
| 3JHXDV | | 0.0720 | 0.0007 | 0.32 | 0.1283 | 0.0008 | 0.25 | OE |
| 3KDPZ2 | | 0.0760 | 0.0047 | 2.20 | 0.1283 | 0.0008 | 0.27 | OE |
| 3RC47W | | 0.0693 | -0.0020 | -0.95 | 0.1237 | -0.0038 | -1.23 | OE |
| 4434EQ | | 0.0713 | 0.0000 | -0.01 | 0.1273 | -0.0002 | -0.05 | OE |
| 46C9RE | | 0.0713 | 0.0000 | -0.01 | 0.1260 | -0.0015 | -0.48 | OE |
| 4CDPZY | | 0.0710 | -0.0003 | -0.16 | 0.1268 | -0.0007 | -0.21 | XX |
| 4XEJBA | | 0.0730 | 0.0017 | 0.78 | 0.1243 | -0.0032 | -1.02 | OE |
| 4YBU7D | | 0.0756 | 0.0042 | 2.00 | 0.1333 | 0.0058 | 1.87 | OE |
| 629VJF | | 0.0710 | -0.0003 | -0.16 | 0.1263 | -0.0012 | -0.37 | OE |
| 6MPCPQ | X | 0.0387 | -0.0327 | -15.46 | 0.1020 | -0.0255 | -8.17 | XX |
| 73XQG8 | | 0.0681 | -0.0032 | -1.54 | 0.1249 | -0.0026 | -0.83 | IC |
| 7LFM28 | | 0.0736 | 0.0023 | 1.08 | 0.1313 | 0.0038 | 1.21 | AE |
| 7Q4AR7 | | 0.0720 | 0.0007 | 0.31 | 0.1267 | -0.0008 | -0.27 | OE |
| 7WUJ36 | | 0.0713 | 0.0000 | -0.02 | 0.1264 | -0.0011 | -0.36 | OE |
| 86HURQ | | 0.0708 | -0.0006 | -0.27 | 0.1271 | -0.0004 | -0.12 | IC |
| 8G3ZAN | | 0.0720 | 0.0007 | 0.31 | 0.1317 | 0.0042 | 1.33 | OE |
| 962X2C | | 0.0728 | 0.0015 | 0.70 | 0.1297 | 0.0022 | 0.69 | OE |
| 99VYYK | | 0.0730 | 0.0017 | 0.80 | 0.1326 | 0.0051 | 1.63 | IC |
| 9DV7L3 | | 0.0710 | -0.0003 | -0.15 | 0.1260 | -0.0015 | -0.49 | XX |
| 9GUGFH | | 0.0747 | 0.0033 | 1.57 | 0.1293 | 0.0018 | 0.57 | OE |
| 9JKHL6 | X | 0.0780 | 0.0067 | 3.15 | 0.1370 | 0.0095 | 3.04 | OE |
| 9L4TGN | X | 0.0603 | -0.0110 | -5.21 | 0.1107 | -0.0168 | -5.40 | OE |
| 9NU2FR | | 0.0703 | -0.0010 | -0.48 | 0.1263 | -0.0012 | -0.37 | OE |
| 9RB4R4 | | 0.0710 | -0.0003 | -0.16 | 0.1270 | -0.0005 | -0.16 | OE |
| 9UL26L | | 0.0713 | 0.0000 | -0.01 | 0.1283 | 0.0008 | 0.27 | AE |
| A2XP8L | | 0.0711 | -0.0002 | -0.12 | 0.1270 | -0.0005 | -0.16 | AE |
| AMFWLZ | X | 0.0800 | 0.0087 | 4.09 | 0.1200 | -0.0075 | -2.40 | AA |
| C3YA9Q | | 0.0740 | 0.0027 | 1.26 | 0.1273 | -0.0002 | -0.05 | IC |
| C3YELE | X | 0.0629 | -0.0085 | -4.01 | 0.1127 | -0.0148 | -4.75 | OE |
| CBD7YJ | | 0.0703 | -0.0010 | -0.48 | 0.1280 | 0.0005 | 0.16 | IC |
| CEA2FX | | 0.0723 | 0.0010 | 0.47 | 0.1279 | 0.0004 | 0.13 | OE |
| CEYZUY | | 0.0677 | -0.0037 | -1.74 | 0.1217 | -0.0058 | -1.87 | XX |
| CGY9X9 | * | 0.0653 | -0.0061 | -2.88 | 0.1203 | -0.0072 | -2.31 | OE |
| CHXDE3 | | 0.0727 | 0.0013 | 0.63 | 0.1307 | 0.0032 | 1.01 | OE |
| CTVAJP | | 0.0690 | -0.0023 | -1.11 | 0.1273 | -0.0002 | -0.05 | OE |
| CU8QW4 | | 0.0730 | 0.0017 | 0.78 | 0.1297 | 0.0022 | 0.69 | GD |
| D7E2XY | X | 0.0993 | 0.0280 | 13.24 | 0.1550 | 0.0275 | 8.81 | OE |
| D7YZUW | | 0.0720 | 0.0007 | 0.31 | 0.1243 | -0.0032 | -1.02 | OE |
| D9N7C9 | X | 0.0822 | 0.0109 | 5.15 | 0.1343 | 0.0068 | 2.18 | OE |
| DH7RFG | | 0.0770 | 0.0057 | 2.68 | 0.1347 | 0.0072 | 2.30 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1607

Carbon & Low Alloy Steel, CHROMIUM (Cr)
CHROMIUM (Cr)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | * | 0.0715 | 0.0001 | 0.07 | 0.1205 | -0.0070 | -2.24 | XX |
| DKGRGH | * | 0.0770 | 0.0057 | 2.68 | 0.1253 | -0.0022 | -0.70 | OE |
| DLALF8 | | 0.0720 | 0.0007 | 0.31 | 0.1260 | -0.0015 | -0.48 | OE |
| DNF4E3 | X | 0.0815 | 0.0102 | 4.82 | 0.1284 | 0.0009 | 0.30 | OE |
| DT9842 | X | 0.0497 | -0.0217 | -10.26 | 0.1167 | -0.0108 | -3.47 | OE |
| DWVPLL | | 0.0702 | -0.0011 | -0.54 | 0.1265 | -0.0010 | -0.32 | OE |
| EK984Y | | 0.0720 | 0.0007 | 0.31 | 0.1287 | 0.0012 | 0.37 | OE |
| EXW8Y8 | | 0.0730 | 0.0017 | 0.78 | 0.1267 | -0.0008 | -0.27 | OE |
| EYTPYN | | 0.0714 | 0.0000 | 0.01 | 0.1268 | -0.0007 | -0.23 | OE |
| F6GPUU | | 0.0704 | -0.0010 | -0.46 | 0.1254 | -0.0021 | -0.67 | OE |
| F7QPWG | X | 0.0757 | 0.0043 | 2.04 | 0.1400 | 0.0125 | 4.00 | GD |
| F8HXWJ | | 0.0717 | 0.0004 | 0.17 | 0.1274 | -0.0001 | -0.02 | OE |
| FA84EV | | 0.0700 | -0.0013 | -0.64 | 0.1300 | 0.0025 | 0.80 | OE |
| FCCRW7 | | 0.0735 | 0.0021 | 1.00 | 0.1304 | 0.0029 | 0.94 | OE |
| FEZ4VC | | 0.0737 | 0.0023 | 1.10 | 0.1357 | 0.0082 | 2.62 | OE |
| FFVMWD | | 0.0710 | -0.0003 | -0.16 | 0.1280 | 0.0005 | 0.16 | OE |
| FPMXBE | | 0.0702 | -0.0012 | -0.56 | 0.1246 | -0.0029 | -0.94 | OE |
| FTHWGX | | 0.0682 | -0.0032 | -1.50 | 0.1216 | -0.0059 | -1.88 | OE |
| G4JUQJ | | 0.0710 | -0.0003 | -0.16 | 0.1263 | -0.0012 | -0.37 | AE |
| GY7VD4 | X | 0.0790 | 0.0077 | 3.62 | 0.1270 | -0.0005 | -0.16 | OE |
| HBFPNG | | 0.0700 | -0.0013 | -0.64 | 0.1300 | 0.0025 | 0.80 | OE |
| HHEK2L | | 0.0709 | -0.0004 | -0.21 | 0.1290 | 0.0015 | 0.48 | IC |
| HJ4QGC | | 0.0696 | -0.0017 | -0.83 | 0.1211 | -0.0064 | -2.05 | OE |
| HRF2TC | | 0.0696 | -0.0018 | -0.84 | 0.1260 | -0.0015 | -0.48 | OE |
| J3FQAD | | 0.0720 | 0.0007 | 0.31 | 0.1290 | 0.0015 | 0.48 | OE |
| J4BEN3 | | 0.0707 | -0.0007 | -0.32 | 0.1270 | -0.0005 | -0.16 | OE |
| J94HFK | | 0.0710 | -0.0003 | -0.15 | 0.1330 | 0.0055 | 1.76 | OE |
| JVFECV | | 0.0711 | -0.0002 | -0.12 | 0.1265 | -0.0010 | -0.31 | OE |
| K3TPYU | | 0.0714 | 0.0001 | 0.04 | 0.1264 | -0.0011 | -0.36 | OE |
| K4P697 | | 0.0719 | 0.0006 | 0.28 | 0.1270 | -0.0005 | -0.16 | OE |
| KJMALA | | 0.0735 | 0.0022 | 1.04 | 0.1287 | 0.0012 | 0.37 | OE |
| KNT624 | | 0.0746 | 0.0033 | 1.54 | 0.1270 | -0.0005 | -0.16 | OE |
| KU4YHU | | 0.0707 | -0.0007 | -0.32 | 0.1247 | -0.0028 | -0.91 | XX |
| LCKF89 | | 0.0703 | -0.0010 | -0.48 | 0.1257 | -0.0018 | -0.59 | XX |
| LHLYY7 | | 0.0730 | 0.0017 | 0.78 | 0.1287 | 0.0012 | 0.37 | OE |
| LYWBVC | | 0.0696 | -0.0018 | -0.84 | 0.1253 | -0.0022 | -0.70 | OE |
| MTXLKC | | 0.0769 | 0.0055 | 2.61 | 0.1316 | 0.0041 | 1.31 | OE |
| MYL9FG | | 0.0683 | -0.0030 | -1.42 | 0.1273 | -0.0002 | -0.05 | OE |
| NDG3C9 | | 0.0710 | -0.0003 | -0.16 | 0.1287 | 0.0012 | 0.37 | OE |
| NEBXTF | | 0.0690 | -0.0024 | -1.13 | 0.1301 | 0.0026 | 0.83 | XX |
| NGYARV | | 0.0695 | -0.0018 | -0.86 | 0.1237 | -0.0038 | -1.23 | DR |
| NNKXVD | | 0.0715 | 0.0002 | 0.09 | 0.1282 | 0.0007 | 0.22 | OE |
| NPC426 | | 0.0710 | -0.0003 | -0.16 | 0.1280 | 0.0005 | 0.16 | OE |
| NRJAQD | | 0.0710 | -0.0003 | -0.16 | 0.1267 | -0.0008 | -0.27 | OE |
| P2PLEU | | 0.0707 | -0.0006 | -0.29 | 0.1257 | -0.0018 | -0.59 | OE |
| P4QQRE | | 0.0692 | -0.0021 | -1.00 | 0.1250 | -0.0025 | -0.80 | IC |
| P7ZW8N | | 0.0706 | -0.0007 | -0.35 | 0.1282 | 0.0007 | 0.22 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1607

Carbon & Low Alloy Steel, CHROMIUM (Cr)
CHROMIUM (Cr)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PBUNLD | X | 0.0714 | 0.0001 | 0.04 | 0.1423 | 0.0148 | 4.75 | OE |
| PDLKB8 | | 0.0700 | -0.0013 | -0.64 | 0.1243 | -0.0032 | -1.02 | OE |
| PQ4G6A | | 0.0727 | 0.0013 | 0.63 | 0.1297 | 0.0022 | 0.70 | OE |
| PQJZP8 | | 0.0745 | 0.0032 | 1.49 | 0.1290 | 0.0015 | 0.48 | IC |
| PRX8BN | | 0.0681 | -0.0032 | -1.54 | 0.1287 | 0.0012 | 0.38 | OE |
| Q9GFPX | | 0.0700 | -0.0013 | -0.64 | 0.1237 | -0.0038 | -1.23 | OE |
| QRWPTJ | X | 0.0640 | -0.0073 | -3.47 | 0.1190 | -0.0085 | -2.72 | GD |
| QT3ET8 | | 0.0727 | 0.0014 | 0.64 | 0.1310 | 0.0035 | 1.12 | GD |
| R8F3HV | | 0.0743 | 0.0030 | 1.41 | 0.1353 | 0.0078 | 2.51 | IC |
| RA9VEZ | | 0.0683 | -0.0030 | -1.42 | 0.1227 | -0.0048 | -1.55 | OE |
| RHNHN4 | | 0.0687 | -0.0026 | -1.25 | 0.1256 | -0.0019 | -0.62 | OE |
| RZJ8HC | | 0.0718 | 0.0004 | 0.20 | 0.1284 | 0.0009 | 0.28 | OE |
| T68AZ3 | | 0.0700 | -0.0013 | -0.64 | 0.1250 | -0.0025 | -0.80 | IC |
| T7QXM3 | X | 0.0787 | 0.0074 | 3.48 | 0.1365 | 0.0090 | 2.88 | OE |
| T8HUAC | | 0.0733 | 0.0020 | 0.92 | 0.1305 | 0.0030 | 0.95 | IC |
| T8Z3ZR | X | 0.0643 | -0.0070 | -3.32 | 0.1433 | 0.0158 | 5.07 | IC |
| TZJHYZ | | 0.0670 | -0.0043 | -2.06 | 0.1223 | -0.0052 | -1.66 | OE |
| U3LRHG | | 0.0740 | 0.0027 | 1.26 | 0.1340 | 0.0065 | 2.08 | OE |
| UJ96YU | X | 0.0653 | -0.0060 | -2.84 | 0.1163 | -0.0112 | -3.58 | XX |
| UN4W8R | | 0.0723 | 0.0010 | 0.47 | 0.1283 | 0.0008 | 0.27 | IC |
| UPDZ23 | X | 0.0825 | 0.0111 | 5.26 | 0.1225 | -0.0050 | -1.61 | OE |
| V4BFHN | | 0.0677 | -0.0037 | -1.74 | 0.1200 | -0.0075 | -2.40 | XX |
| VDCZHV | | 0.0713 | 0.0000 | -0.02 | 0.1270 | -0.0005 | -0.16 | IC |
| VM2NDX | X | 0.0803 | 0.0090 | 4.25 | 0.1353 | 0.0078 | 2.51 | OE |
| VU3W4Y | | 0.0707 | -0.0007 | -0.32 | 0.1250 | -0.0025 | -0.80 | OE |
| VWVTQ8 | | 0.0700 | -0.0013 | -0.64 | 0.1257 | -0.0018 | -0.59 | IC |
| VYXQ2Z | | 0.0732 | 0.0018 | 0.86 | 0.1271 | -0.0004 | -0.12 | OE |
| W9XMCG | | 0.0710 | -0.0003 | -0.16 | 0.1290 | 0.0015 | 0.48 | IC |
| WB4822 | | 0.0721 | 0.0008 | 0.36 | 0.1292 | 0.0017 | 0.55 | IC |
| WPNM8M | | 0.0720 | 0.0007 | 0.31 | 0.1270 | -0.0005 | -0.16 | AE |
| WRDR4Z | | 0.0727 | 0.0014 | 0.64 | 0.1290 | 0.0015 | 0.48 | OE |
| WVEXGK | | 0.0709 | -0.0005 | -0.23 | 0.1249 | -0.0026 | -0.84 | OE |
| X366CV | | 0.0707 | -0.0006 | -0.29 | 0.1255 | -0.0020 | -0.63 | OE |
| XD7BMW | | 0.0677 | -0.0037 | -1.74 | 0.1277 | 0.0002 | 0.05 | XX |
| XL29E7 | | 0.0677 | -0.0037 | -1.74 | 0.1230 | -0.0045 | -1.44 | OE |
| YDNUV2 | | 0.0707 | -0.0007 | -0.32 | 0.1287 | 0.0012 | 0.37 | OE |
| YPJTYZ | X | 0.0693 | -0.0020 | -0.95 | 0.1120 | -0.0155 | -4.97 | OE |
| YQURVU | | 0.0720 | 0.0007 | 0.31 | 0.1280 | 0.0005 | 0.16 | IC |
| YWGHP | | 0.0693 | -0.0020 | -0.95 | 0.1247 | -0.0028 | -0.91 | XX |
| YZFTDP | | 0.0703 | -0.0010 | -0.48 | 0.1283 | 0.0008 | 0.27 | IC |
| ZC78RC | | 0.0740 | 0.0027 | 1.26 | 0.1310 | 0.0035 | 1.12 | GD |
| ZD2N8V | | 0.0681 | -0.0032 | -1.51 | 0.1211 | -0.0065 | -2.07 | OE |
| ZHURVT | X | 0.0627 | -0.0087 | -4.11 | 0.1277 | 0.0002 | 0.05 | XR |
| ZM9KVX | | 0.0745 | 0.0032 | 1.49 | 0.1303 | 0.0028 | 0.91 | OE |
| ZRKBC | | 0.0756 | 0.0043 | 2.03 | 0.1317 | 0.0042 | 1.33 | OE |
| ZYLHZ3 | X | 0.0677 | -0.0037 | -1.74 | 0.1160 | -0.0115 | -3.69 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1607

Carbon & Low Alloy Steel, CHROMIUM (Cr)
CHROMIUM (Cr)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.0713 | Percent | 0.1275 | Percent |
| Std Dev Btwn Labs | 0.0021 | Percent | 0.0031 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 115 of 140 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1607

- 2AWLDB (X) - Data for sample L70 are low.
- 2KE2HY (X) - Data for sample L70 are high.
- 6MPCPQ (X) - Data for both samples are low.
- 9JKHL6 (X) - Data for both samples are high.
- 9L4TGN (X) - Data for both samples are low.
- AMFWLZ (X) - Data for sample L69 are high. Inconsistent within the determinations of both samples.
- C3YELE (X) - Data for both samples are low.
- D7E2XY (X) - Data for both samples are high. Inconsistent within the determinations of sample L69.
- D9N7C9 (X) - Data for sample L69 are high.
- DNF4E3 (X) - Data for sample L69 are high.
- DT9842 (X) - Data for both samples are low. Inconsistent within the determinations of sample L70.
- F7QPWG (X) - Data for sample L70 are high.
- GY7VD4 (X) - Data for sample L69 are high.
- PBUNLD (X) - Data for sample L70 are high. Inconsistent within the determinations of both samples.
- QRWPTJ (X) - Data for sample L69 are low.
- T7QXM3 (X) - Data for both samples are high.
- T8Z3ZR (X) - Data for sample L69 are low and data for sample L70 are high. Inconsistent within the determinations of both samples.
- UJ96YU (X) - Data for both samples are low.
- UPDZ23 (X) - Data for sample L69 are high.
- VM2NDX (X) - Data for sample L69 are high.
- YPJTYZ (X) - Data for sample L70 are low.
- ZHURVT (X) - Data for sample L69 are low. Inconsistent within the determinations of sample L69.
- ZYLHZ3 (X) - Data for sample L70 are low.



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1607

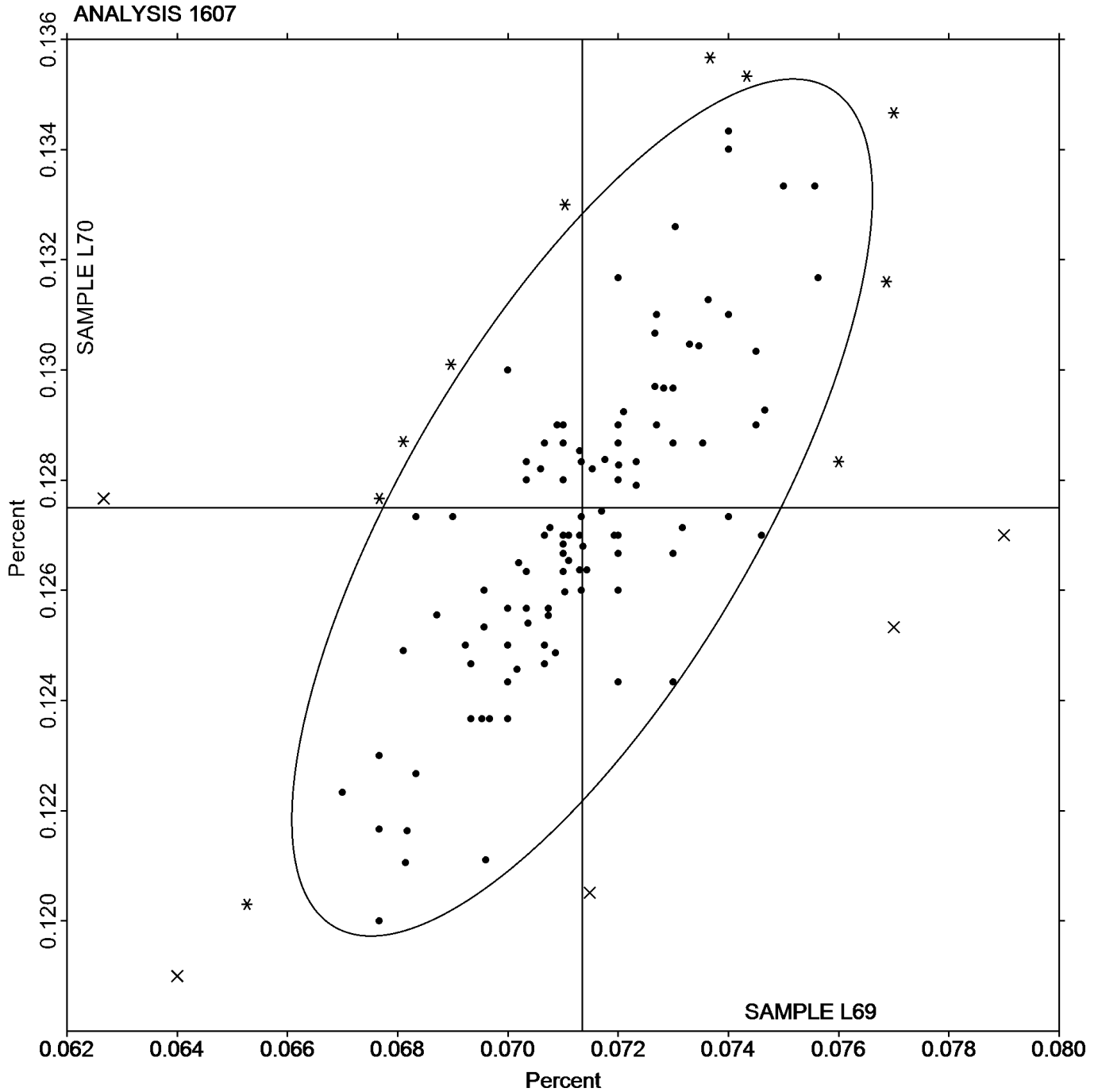
Carbon & Low Alloy Steel, CHROMIUM (Cr)
CHROMIUM (Cr)

SAMPLE L69

0.0713 Percent

SAMPLE L70

0.1275 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1608

Carbon & Low Alloy Steel, COPPER (Cu)
COPPER (Cu)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | | 0.2314 | -0.0088 | -1.87 | 0.1791 | -0.0060 | -1.65 | OE |
| 2GKXZT | | 0.2360 | -0.0042 | -0.90 | 0.1823 | -0.0028 | -0.77 | OE |
| 2HRC8Y | | 0.2400 | -0.0002 | -0.05 | 0.1870 | 0.0019 | 0.51 | GD |
| 2J6V3P | X | 0.2617 | 0.0214 | 4.56 | 0.1817 | -0.0035 | -0.96 | OE |
| 2KE2HY | | 0.2400 | -0.0002 | -0.05 | 0.1900 | 0.0049 | 1.33 | OE |
| 2KJ9VT | | 0.2393 | -0.0009 | -0.19 | 0.1853 | 0.0002 | 0.05 | OE |
| 2M68YP | | 0.2394 | -0.0008 | -0.17 | 0.1821 | -0.0030 | -0.83 | XX |
| 3JHXDV | | 0.2425 | 0.0023 | 0.48 | 0.1850 | -0.0001 | -0.04 | OE |
| 3KDPZ2 | | 0.2390 | -0.0012 | -0.26 | 0.1847 | -0.0005 | -0.13 | WD |
| 3RC47W | X | 0.2373 | -0.0029 | -0.62 | 0.1953 | 0.0102 | 2.80 | OE |
| 4434EQ | | 0.2367 | -0.0036 | -0.76 | 0.1800 | -0.0051 | -1.41 | OE |
| 46C9RE | | 0.2450 | 0.0048 | 1.02 | 0.1853 | 0.0002 | 0.05 | OE |
| 4CDPZY | | 0.2420 | 0.0018 | 0.38 | 0.1811 | -0.0040 | -1.10 | XX |
| 4XEJBA | | 0.2407 | 0.0004 | 0.09 | 0.1880 | 0.0029 | 0.78 | OE |
| 4YBU7D | | 0.2443 | 0.0041 | 0.87 | 0.1927 | 0.0075 | 2.06 | OE |
| 629VJF | | 0.2410 | 0.0008 | 0.16 | 0.1877 | 0.0025 | 0.69 | OE |
| 6MPCPQ | * | 0.2360 | -0.0042 | -0.90 | 0.1907 | 0.0055 | 1.52 | XX |
| 73XQG8 | | 0.2370 | -0.0032 | -0.68 | 0.1803 | -0.0049 | -1.34 | IC |
| 7LFM28 | X | 0.2245 | -0.0158 | -3.35 | 0.1800 | -0.0051 | -1.41 | AE |
| 7Q4AR7 | | 0.2430 | 0.0028 | 0.59 | 0.1877 | 0.0025 | 0.69 | OE |
| 7WUJ36 | | 0.2353 | -0.0050 | -1.06 | 0.1842 | -0.0009 | -0.25 | OE |
| 86HURQ | | 0.2456 | 0.0054 | 1.15 | 0.1901 | 0.0049 | 1.35 | IC |
| 8G3ZAN | | 0.2380 | -0.0022 | -0.47 | 0.1830 | -0.0021 | -0.59 | OE |
| 962X2C | X | 0.2410 | 0.0008 | 0.16 | 0.1963 | 0.0112 | 3.07 | OE |
| 99VYYK | | 0.2461 | 0.0058 | 1.24 | 0.1926 | 0.0074 | 2.04 | IC |
| 9DV7L3 | | 0.2387 | -0.0016 | -0.33 | 0.1851 | 0.0000 | 0.00 | XX |
| 9GUGFH | | 0.2492 | 0.0090 | 1.92 | 0.1908 | 0.0057 | 1.55 | OE |
| 9JKHL6 | | 0.2470 | 0.0068 | 1.44 | 0.1900 | 0.0049 | 1.33 | OE |
| 9L4TGN | | 0.2440 | 0.0038 | 0.80 | 0.1880 | 0.0029 | 0.78 | OE |
| 9NU2FR | * | 0.2270 | -0.0132 | -2.82 | 0.1780 | -0.0071 | -1.96 | OE |
| 9RB4R4 | | 0.2417 | 0.0014 | 0.31 | 0.1857 | 0.0005 | 0.14 | OE |
| 9UL26L | | 0.2413 | 0.0011 | 0.24 | 0.1877 | 0.0025 | 0.69 | AE |
| A2XP8L | | 0.2420 | 0.0018 | 0.38 | 0.1850 | -0.0001 | -0.04 | AE |
| AMFWLZ | * | 0.2400 | -0.0002 | -0.05 | 0.1800 | -0.0051 | -1.41 | AA |
| C3YA9Q | | 0.2353 | -0.0049 | -1.04 | 0.1823 | -0.0028 | -0.77 | IC |
| C3YELE | | 0.2387 | -0.0016 | -0.33 | 0.1847 | -0.0005 | -0.13 | OE |
| CBD7YJ | | 0.2387 | -0.0016 | -0.33 | 0.1840 | -0.0011 | -0.31 | IC |
| CEA2FX | | 0.2411 | 0.0009 | 0.19 | 0.1874 | 0.0022 | 0.61 | XR |
| CEYZUY | | 0.2450 | 0.0048 | 1.02 | 0.1890 | 0.0039 | 1.06 | XX |
| CGY9X9 | | 0.2405 | 0.0003 | 0.06 | 0.1839 | -0.0013 | -0.35 | OE |
| CHXDE3 | | 0.2293 | -0.0109 | -2.32 | 0.1787 | -0.0065 | -1.78 | OE |
| CTVAJP | | 0.2323 | -0.0079 | -1.68 | 0.1807 | -0.0045 | -1.23 | OE |
| CU8QW4 | | 0.2423 | 0.0021 | 0.45 | 0.1867 | 0.0015 | 0.42 | GD |
| D7E2XY | X | 0.2480 | 0.0078 | 1.65 | 0.2003 | 0.0152 | 4.17 | OE |
| D7YZUW | | 0.2383 | -0.0019 | -0.40 | 0.1860 | 0.0009 | 0.23 | OE |
| D9N7C9 | X | 0.2159 | -0.0243 | -5.18 | 0.1635 | -0.0217 | -5.95 | OE |
| DH7RFG | | 0.2393 | -0.0009 | -0.19 | 0.1857 | 0.0005 | 0.14 | IC |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1608

Carbon & Low Alloy Steel, COPPER (Cu)
COPPER (Cu)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| DJJEVB | | 0.2407 | 0.0004 | 0.10 | 0.1864 | 0.0013 | 0.36 | XX |
| DKGRGH | | 0.2323 | -0.0079 | -1.68 | 0.1810 | -0.0041 | -1.14 | OE |
| DLALF8 | | 0.2437 | 0.0034 | 0.73 | 0.1877 | 0.0025 | 0.69 | OE |
| DNF4E3 | | 0.2391 | -0.0012 | -0.25 | 0.1826 | -0.0025 | -0.70 | OE |
| DT9842 | X | 0.1837 | -0.0566 | -12.04 | 0.1267 | -0.0585 | -16.05 | OE |
| DWVPLL | X | 0.2164 | -0.0238 | -5.06 | 0.1695 | -0.0156 | -4.29 | OE |
| EK984Y | | 0.2497 | 0.0094 | 2.01 | 0.1893 | 0.0042 | 1.15 | OE |
| EXW8Y8 | | 0.2377 | -0.0026 | -0.55 | 0.1837 | -0.0015 | -0.41 | OE |
| EYTPYN | | 0.2392 | -0.0010 | -0.21 | 0.1869 | 0.0018 | 0.49 | OE |
| F6GPUU | | 0.2410 | 0.0008 | 0.17 | 0.1856 | 0.0004 | 0.12 | OE |
| F7QPWG | | 0.2500 | 0.0098 | 2.08 | 0.1900 | 0.0049 | 1.33 | GD |
| F8HXWJ | | 0.2331 | -0.0071 | -1.51 | 0.1796 | -0.0056 | -1.53 | OE |
| FA84EV | | 0.2403 | 0.0001 | 0.02 | 0.1840 | -0.0011 | -0.31 | OE |
| FCCRW7 | | 0.2447 | 0.0045 | 0.95 | 0.1841 | -0.0011 | -0.30 | OE |
| FEZ4VC | | 0.2430 | 0.0028 | 0.59 | 0.1870 | 0.0019 | 0.51 | OE |
| FFVMWD | | 0.2370 | -0.0032 | -0.69 | 0.1840 | -0.0011 | -0.31 | OE |
| FPMXBE | X | 0.2507 | 0.0105 | 2.23 | 0.1982 | 0.0130 | 3.57 | OE |
| FTHWGX | | 0.2303 | -0.0099 | -2.11 | 0.1765 | -0.0086 | -2.37 | OE |
| G4JUQJ | | 0.2393 | -0.0009 | -0.19 | 0.1820 | -0.0031 | -0.86 | AA |
| GY7VD4 | | 0.2343 | -0.0059 | -1.25 | 0.1807 | -0.0045 | -1.23 | OE |
| HBFPNG | | 0.2400 | -0.0002 | -0.05 | 0.1800 | -0.0051 | -1.41 | OE |
| HHEK2L | | 0.2477 | 0.0074 | 1.58 | 0.1917 | 0.0065 | 1.79 | IC |
| HJ4QGC | | 0.2358 | -0.0044 | -0.94 | 0.1801 | -0.0050 | -1.39 | OE |
| HRF2TC | | 0.2310 | -0.0092 | -1.96 | 0.1797 | -0.0055 | -1.50 | OE |
| J3FQAD | | 0.2417 | 0.0014 | 0.31 | 0.1860 | 0.0009 | 0.23 | OE |
| J4BEN3 | | 0.2393 | -0.0009 | -0.19 | 0.1807 | -0.0045 | -1.23 | OE |
| J94HFK | | 0.2417 | 0.0014 | 0.31 | 0.1880 | 0.0029 | 0.78 | OE |
| JVFECV | X | 0.2220 | -0.0183 | -3.89 | 0.1726 | -0.0125 | -3.44 | OE |
| K3TPYU | | 0.2442 | 0.0040 | 0.85 | 0.1866 | 0.0014 | 0.39 | OE |
| K4P697 | * | 0.2303 | -0.0099 | -2.11 | 0.1937 | 0.0085 | 2.34 | OE |
| KJMALA | | 0.2417 | 0.0014 | 0.31 | 0.1880 | 0.0029 | 0.78 | OE |
| KNT624 | | 0.2420 | 0.0018 | 0.38 | 0.1830 | -0.0021 | -0.59 | OE |
| KU4YHU | | 0.2333 | -0.0069 | -1.47 | 0.1810 | -0.0041 | -1.14 | XX |
| LCKF89 | | 0.2387 | -0.0016 | -0.33 | 0.1847 | -0.0005 | -0.13 | XX |
| LHLYY7 | | 0.2340 | -0.0062 | -1.33 | 0.1813 | -0.0038 | -1.05 | OE |
| LYWBYC | | 0.2397 | -0.0006 | -0.12 | 0.1857 | 0.0005 | 0.14 | OE |
| MTXLKC | | 0.2420 | 0.0018 | 0.38 | 0.1886 | 0.0035 | 0.95 | XX |
| MYL9FG | | 0.2390 | -0.0012 | -0.26 | 0.1840 | -0.0011 | -0.31 | OE |
| NDG3C9 | | 0.2400 | -0.0002 | -0.05 | 0.1840 | -0.0011 | -0.31 | OE |
| NEBXTTP | | 0.2457 | 0.0055 | 1.16 | 0.1886 | 0.0035 | 0.95 | XX |
| NGYARV | | 0.2348 | -0.0055 | -1.16 | 0.1807 | -0.0044 | -1.21 | DR |
| NNKXVD | | 0.2458 | 0.0056 | 1.19 | 0.1903 | 0.0052 | 1.42 | OE |
| NPC426 | | 0.2337 | -0.0066 | -1.40 | 0.1833 | -0.0018 | -0.50 | OE |
| NRJAQD | | 0.2457 | 0.0054 | 1.16 | 0.1880 | 0.0029 | 0.78 | OE |
| P2PLEU | | 0.2416 | 0.0013 | 0.28 | 0.1863 | 0.0012 | 0.32 | OE |
| P4QQRE | | 0.2403 | 0.0001 | 0.02 | 0.1853 | 0.0002 | 0.05 | IC |
| P7ZW8N | * | 0.2374 | -0.0028 | -0.60 | 0.1764 | -0.0088 | -2.41 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1608

Carbon & Low Alloy Steel, COPPER (Cu)
COPPER (Cu)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------|-----------------------|--------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| PBUNLD | | 0.2410 | 0.0008 | 0.16 | 0.1857 | 0.0005 | 0.14 | OE |
| PDLKB8 | | 0.2397 | -0.0006 | -0.12 | 0.1847 | -0.0005 | -0.13 | OE |
| PQ4G6A | | 0.2386 | -0.0016 | -0.35 | 0.1845 | -0.0006 | -0.17 | OE |
| PQJZP8 | | 0.2402 | 0.0000 | -0.01 | 0.1860 | 0.0009 | 0.24 | IC |
| PRX8BN | | 0.2353 | -0.0049 | -1.05 | 0.1843 | -0.0008 | -0.22 | OE |
| Q9GFPX | * | 0.2540 | 0.0138 | 2.93 | 0.1960 | 0.0109 | 2.98 | OE |
| QRWPTJ | X | 0.2597 | 0.0194 | 4.14 | 0.1980 | 0.0129 | 3.53 | GD |
| QT3ET8 | | 0.2430 | 0.0028 | 0.59 | 0.1880 | 0.0029 | 0.78 | GD |
| R8F3HV | | 0.2347 | -0.0056 | -1.18 | 0.1810 | -0.0041 | -1.14 | IC |
| RA9VEZ | X | 0.2347 | -0.0056 | -1.18 | 0.1570 | -0.0281 | -7.73 | OE |
| RHNHN4 | X | 0.2585 | 0.0183 | 3.89 | 0.1977 | 0.0125 | 3.44 | OE |
| RZJ8HC | X | 0.2563 | 0.0161 | 3.43 | 0.1985 | 0.0134 | 3.67 | OE |
| T68AZ3 | | 0.2470 | 0.0068 | 1.44 | 0.1920 | 0.0069 | 1.88 | XX |
| T7QXM3 | | 0.2370 | -0.0033 | -0.69 | 0.1839 | -0.0012 | -0.33 | OE |
| T8HUAC | | 0.2351 | -0.0052 | -1.10 | 0.1819 | -0.0032 | -0.88 | IC |
| T8Z3ZR | | 0.2390 | -0.0012 | -0.26 | 0.1840 | -0.0011 | -0.31 | IC |
| TZJHYZ | | 0.2317 | -0.0086 | -1.82 | 0.1807 | -0.0045 | -1.23 | OE |
| U3LRHG | | 0.2370 | -0.0032 | -0.69 | 0.1810 | -0.0041 | -1.14 | OE |
| UJ96YU | | 0.2527 | 0.0124 | 2.65 | 0.1940 | 0.0089 | 2.43 | XX |
| UN4W8R | | 0.2423 | 0.0021 | 0.45 | 0.1853 | 0.0002 | 0.05 | IC |
| UPDZ23 | | 0.2386 | -0.0017 | -0.35 | 0.1856 | 0.0005 | 0.13 | OE |
| V4BFHN | | 0.2363 | -0.0039 | -0.83 | 0.1803 | -0.0048 | -1.32 | XX |
| VDCZHV | | 0.2426 | 0.0023 | 0.50 | 0.1856 | 0.0004 | 0.12 | IC |
| VM2NDX | X | 0.1187 | -0.1216 | -25.87 | 0.0920 | -0.0931 | -25.57 | OE |
| VU3W4Y | | 0.2440 | 0.0038 | 0.80 | 0.1840 | -0.0011 | -0.31 | OE |
| VWVTQ8 | | 0.2437 | 0.0034 | 0.73 | 0.1880 | 0.0029 | 0.78 | IC |
| VYXQ2Z | | 0.2431 | 0.0028 | 0.60 | 0.1868 | 0.0017 | 0.45 | OE |
| W9XMCG | | 0.2403 | 0.0001 | 0.02 | 0.1867 | 0.0015 | 0.42 | IC |
| WB4822 | | 0.2423 | 0.0021 | 0.44 | 0.1869 | 0.0018 | 0.49 | IC |
| WPNM8M | | 0.2387 | -0.0016 | -0.33 | 0.1850 | -0.0001 | -0.04 | AE |
| WRDR4Z | | 0.2450 | 0.0048 | 1.02 | 0.1900 | 0.0049 | 1.33 | OE |
| WVEXGK | | 0.2394 | -0.0008 | -0.18 | 0.1852 | 0.0000 | 0.01 | OE |
| X366CV | | 0.2440 | 0.0038 | 0.80 | 0.1883 | 0.0032 | 0.87 | OE |
| XD7BMW | | 0.2343 | -0.0059 | -1.25 | 0.1817 | -0.0035 | -0.96 | XX |
| XL29E7 | | 0.2393 | -0.0009 | -0.19 | 0.1887 | 0.0035 | 0.97 | OE |
| YDNUV2 | | 0.2397 | -0.0006 | -0.12 | 0.1857 | 0.0005 | 0.14 | OE |
| YHF7LQ | | 0.2390 | -0.0012 | -0.26 | 0.1870 | 0.0019 | 0.51 | DR |
| YPJTYZ | | 0.2477 | 0.0074 | 1.58 | 0.1857 | 0.0005 | 0.14 | OE |
| YQURVU | | 0.2403 | 0.0001 | 0.02 | 0.1803 | -0.0048 | -1.32 | IC |
| YWGHP | | 0.2417 | 0.0014 | 0.31 | 0.1823 | -0.0028 | -0.77 | XX |
| YZFTDP | | 0.2397 | -0.0006 | -0.12 | 0.1860 | 0.0009 | 0.23 | IC |
| ZC78RC | | 0.2353 | -0.0049 | -1.04 | 0.1790 | -0.0061 | -1.69 | GD |
| ZD2N8V | | 0.2470 | 0.0068 | 1.44 | 0.1914 | 0.0063 | 1.72 | OE |
| ZHURVT | X | 0.2547 | 0.0144 | 3.07 | 0.2137 | 0.0285 | 7.83 | XR |
| ZM9KVX | | 0.2390 | -0.0012 | -0.26 | 0.1870 | 0.0019 | 0.51 | OE |
| ZRKBC | | 0.2446 | 0.0044 | 0.93 | 0.1856 | 0.0005 | 0.13 | OE |
| ZYLHZ3 | | 0.2453 | 0.0051 | 1.09 | 0.1880 | 0.0029 | 0.78 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1608

Carbon & Low Alloy Steel, COPPER (Cu)
COPPER (Cu)

Summary Statistics

| | <u>Sample L69</u> | | <u>Sample L70</u> | |
|--------------------------|-------------------|---------|-------------------|---------|
| Grand Means | 0.2402 | Percent | 0.1851 | Percent |
| Std Dev Btwn Labs | 0.0047 | Percent | 0.0036 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 122 of 141 reporting participants

Key to Method Codes Reported by Participants

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

Comments on Assigned Data Flags for Test #1608

- 2J6V3P (X) - Data for sample L69 are high.
- 3RC47W (X) - Data for sample L70 are high.
- 7LFM28 (X) - Data for sample L69 are low.
- 962X2C (X) - Data for sample L70 are high.
- D7E2XY (X) - Data for sample L70 are high.
- D9N7C9 (X) - Data for both samples are low.
- DT9842 (X) - Data for both samples are low.
- DWVPLL (X) - Data for both samples are low.
- FPMXBE (X) - Data for sample L70 are high.
- JVFECV (X) - Data for both samples are low.
- QRWPTJ (X) - Data for both samples are high.
- RA9VEZ (X) - Data for sample L70 are low. Inconsistent within the determinations of sample L70.
- RHNHN4 (X) - Data for both samples are high.
- RZJ8HC (X) - Data for both samples are high.
- VM2NDX (X) - Data for both samples are extremely low.
- ZHURVT (X) - Data for both samples are high. Inconsistent within the determinations of sample L70.



Fasteners and Metals Interlaboratory Testing Program

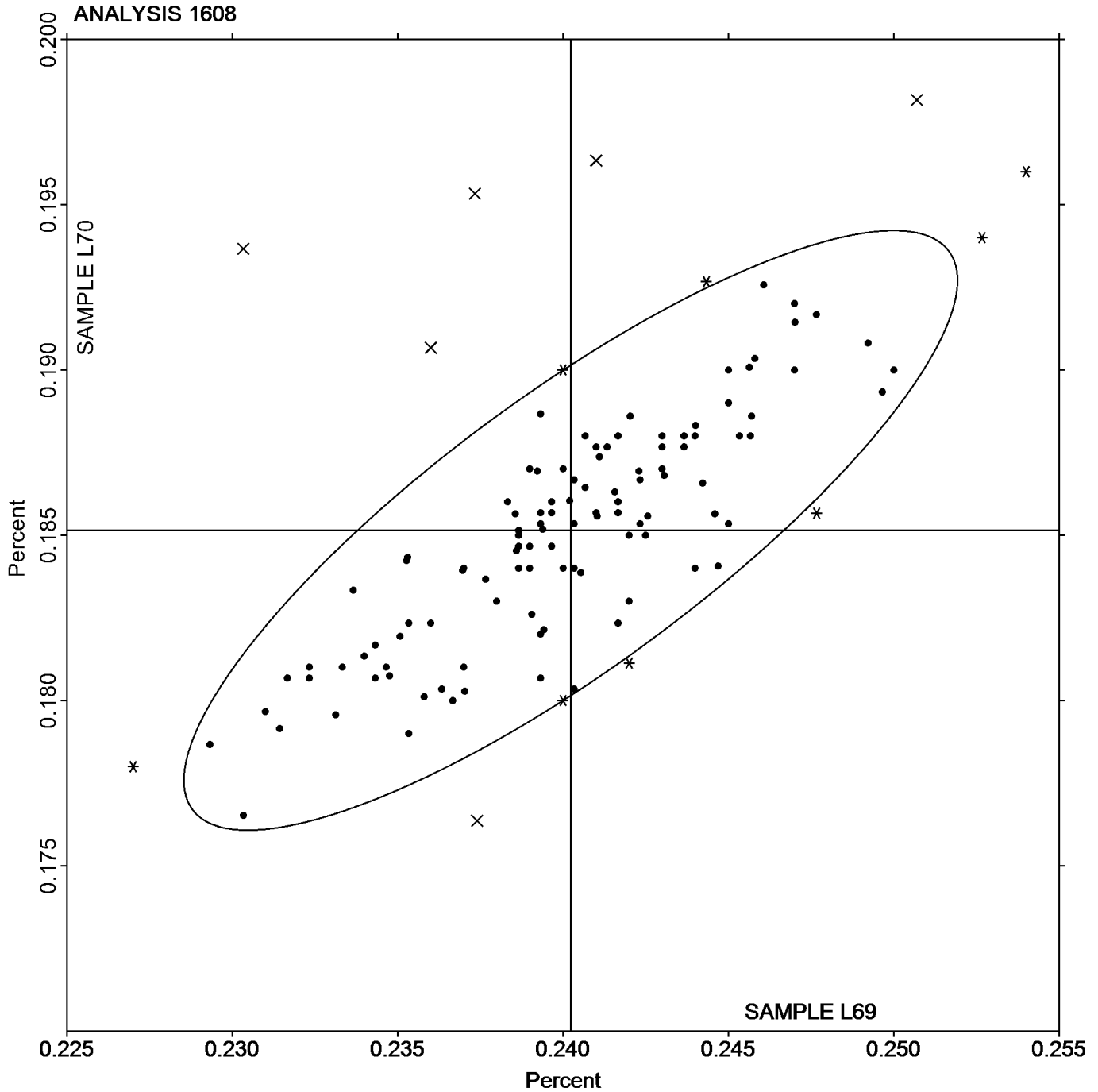
Cycle 131
3rd Qtr 2020

Analysis 1608

Carbon & Low Alloy Steel, COPPER (Cu)
COPPER (Cu)

SAMPLE L69
0.2402 Percent

SAMPLE L70
0.1851 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1612

Carbon & Low Alloy Steel, NITROGEN (N)
NITROGEN (N)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|--------|------------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| 2AWLDB | X | 0.00580 | -0.00342 | -4.53 | 0.00450 | -0.00278 | -4.18 | OE |
| 2GKXZT | X | 0.0181 | 0.00891 | 11.79 | 0.00993 | 0.00266 | 4.01 | OE |
| 2KE2HY | | 0.00900 | -0.00022 | -0.29 | 0.00767 | 0.00039 | 0.59 | OE |
| 2KJ9VT | X | 0.0123 | 0.00311 | 4.12 | 0.0100 | 0.00273 | 4.11 | OE |
| 3KDPZ2 | | 0.00950 | 0.00028 | 0.37 | 0.00757 | 0.00029 | 0.44 | CO |
| 4434EQ | | 0.00943 | 0.00021 | 0.28 | 0.00743 | 0.00016 | 0.24 | OE |
| 46C9RE | * | 0.00717 | -0.00205 | -2.72 | 0.00680 | -0.00047 | -0.71 | OE |
| 4CDPZY | | 0.00840 | -0.00082 | -1.09 | 0.00740 | 0.00013 | 0.19 | XX |
| 73XQG8 | | 0.00997 | 0.00075 | 0.99 | 0.00827 | 0.00099 | 1.49 | XX |
| 7LFM28 | | 0.00913 | -0.00009 | -0.12 | 0.00773 | 0.00046 | 0.69 | XX |
| 7WUJ36 | | 0.00920 | -0.00002 | -0.03 | 0.00723 | -0.00004 | -0.06 | OE |
| 86HURQ | | 0.00933 | 0.00011 | 0.15 | 0.00733 | 0.00006 | 0.09 | CL |
| 99VYYK | | 0.00883 | -0.00039 | -0.51 | 0.00727 | -0.00001 | -0.01 | XX |
| 9GUGFH | | 0.00840 | -0.00082 | -1.09 | 0.00673 | -0.00054 | -0.82 | OE |
| 9JKHL6 | | 0.00913 | -0.00009 | -0.12 | 0.00683 | -0.00044 | -0.66 | CO |
| 9L4TGN | | 0.00977 | 0.00055 | 0.72 | 0.00760 | 0.00033 | 0.49 | CO |
| 9RB4R4 | | 0.00973 | 0.00051 | 0.68 | 0.00730 | 0.00003 | 0.04 | CO |
| A2XP8L | | 0.00833 | -0.00089 | -1.17 | 0.00693 | -0.00034 | -0.51 | AE |
| C3YA9Q | | 0.00990 | 0.00068 | 0.90 | 0.00787 | 0.00059 | 0.89 | CI |
| CBD7YJ | | 0.00937 | 0.00015 | 0.19 | 0.00730 | 0.00003 | 0.04 | XX |
| CEA2FX | | 0.00860 | -0.00062 | -0.82 | 0.00670 | -0.00057 | -0.87 | XX |
| CEYZUY | | 0.00993 | 0.00071 | 0.94 | 0.00790 | 0.00063 | 0.94 | OE |
| CGY9X9 | | 0.00790 | -0.00132 | -1.75 | 0.00623 | -0.00104 | -1.57 | OE |
| D7YZUW | | 0.00807 | -0.00115 | -1.53 | 0.00693 | -0.00034 | -0.51 | OE |
| D9N7C9 | | 0.00790 | -0.00132 | -1.75 | 0.00623 | -0.00104 | -1.57 | OE |
| DJJEVB | M | 0.0119 | 0.00265 | 3.50 | No Data Reported | | | XX |
| DNF4E3 | | 0.00864 | -0.00058 | -0.77 | 0.00637 | -0.00090 | -1.36 | XX |
| F8HXWJ | | 0.00857 | -0.00065 | -0.87 | 0.00643 | -0.00084 | -1.27 | OE |
| FA84EV | | 0.00927 | 0.00005 | 0.06 | 0.00717 | -0.00011 | -0.16 | XX |
| FCCRW7 | | 0.00857 | -0.00065 | -0.87 | 0.00693 | -0.00034 | -0.51 | OE |
| FEZ4VC | | 0.00980 | 0.00058 | 0.77 | 0.00787 | 0.00059 | 0.89 | OE |
| FFVMWD | | 0.00873 | -0.00049 | -0.65 | 0.00687 | -0.00041 | -0.61 | CI |
| FTHWGX | X | 0.0358 | 0.02658 | 35.16 | 0.0360 | 0.02870 | 43.23 | OE |
| G4JUQJ | | 0.0110 | 0.00181 | 2.40 | 0.00903 | 0.00176 | 2.65 | AA |
| GY7VD4 | | 0.00923 | 0.00001 | 0.02 | 0.00743 | 0.00016 | 0.24 | CI |
| HHEK2L | | 0.00950 | 0.00028 | 0.37 | 0.00737 | 0.00009 | 0.14 | XX |
| J4BEN3 | | 0.00890 | -0.00032 | -0.43 | 0.00703 | -0.00024 | -0.36 | CO |
| K4P697 | | 0.00837 | -0.00085 | -1.13 | 0.00670 | -0.00057 | -0.87 | OE |
| KJMALA | | 0.00987 | 0.00065 | 0.85 | 0.00830 | 0.00103 | 1.54 | OE |
| KNT624 | | 0.00910 | -0.00012 | -0.16 | 0.00720 | -0.00007 | -0.11 | OE |
| LHLYY7 | | 0.00910 | -0.00012 | -0.16 | 0.00697 | -0.00031 | -0.46 | OE |
| LYWBYC | | 0.0110 | 0.00178 | 2.35 | 0.00833 | 0.00106 | 1.60 | XX |
| MTXLKC | | 0.00917 | -0.00005 | -0.07 | 0.00737 | 0.00009 | 0.14 | XX |
| MYL9FG | X | 0.00767 | -0.00155 | -2.06 | 0.00700 | -0.00027 | -0.41 | OE |
| NDG3C9 | | 0.00910 | -0.00012 | -0.17 | 0.00746 | 0.00018 | 0.27 | CI |
| NGYARV | X | 0.00317 | -0.00605 | -8.01 | 0.00200 | -0.00527 | -7.95 | DR |
| NPC426 | X | 0.1010 | 0.09178 | 121.39 | 0.0697 | 0.06239 | 93.98 | OE |



Fasteners and Metals Interlaboratory Testing Program

Cycle 131
3rd Qtr 2020

Analysis 1612

Carbon & Low Alloy Steel, NITROGEN (N)
NITROGEN (N)

| WebCode | Data Flag | Sample L69 | | | Sample L70 | | | Method |
|---------|-----------|------------|-----------------------|-------|------------|-----------------------|-------|--------|
| | | Lab Mean | Diff. from Grand Mean | CPV | Lab Mean | Diff. from Grand Mean | CPV | |
| P4QQRE | | 0.00987 | 0.00065 | 0.85 | 0.00790 | 0.00063 | 0.94 | XX |
| PBUNLD | | 0.0104 | 0.00121 | 1.60 | 0.00867 | 0.00139 | 2.10 | OE |
| PQ4G6A | | 0.00973 | 0.00051 | 0.68 | 0.00757 | 0.00029 | 0.44 | OE |
| PQJZP8 | | 0.00971 | 0.00049 | 0.64 | 0.00725 | -0.00003 | -0.04 | IR |
| Q9GFPX | | 0.00883 | -0.00039 | -0.51 | 0.00680 | -0.00047 | -0.71 | XX |
| RA9VEZ | | 0.00870 | -0.00052 | -0.69 | 0.00677 | -0.00051 | -0.76 | OE |
| RZJ8HC | X | 0.00713 | -0.00209 | -2.76 | 0.00917 | 0.00189 | 2.85 | IR |
| T7QXM3 | * | 0.0111 | 0.00185 | 2.44 | 0.00840 | 0.00113 | 1.70 | OE |
| T8Z3ZR | X | 0.00653 | -0.00269 | -3.56 | 0.00543 | -0.00184 | -2.77 | CI |
| UN4W8R | | 0.00853 | -0.00069 | -0.91 | 0.00590 | -0.00137 | -2.07 | CO |
| VDCZHV | | 0.00890 | -0.00032 | -0.43 | 0.00690 | -0.00037 | -0.56 | CI |
| VM2NDX | X | 0.0349 | 0.02568 | 33.96 | 0.0325 | 0.02526 | 38.05 | OE |
| VU3W4Y | | 0.00800 | -0.00122 | -1.62 | 0.00600 | -0.00127 | -1.92 | CI |
| VYXQ2Z | | 0.00960 | 0.00038 | 0.50 | 0.00767 | 0.00039 | 0.59 | XX |
| W9XMCG | | 0.00930 | 0.00008 | 0.10 | 0.00727 | -0.00001 | -0.01 | CO |
| WB4822 | | 0.00947 | 0.00025 | 0.32 | 0.00753 | 0.00026 | 0.39 | XX |
| WPNM8M | | 0.00953 | 0.00031 | 0.41 | 0.00717 | -0.00011 | -0.16 | XX |
| WRDR4Z | X | 0.00203 | -0.00719 | -9.51 | 0.000833 | -0.00644 | -9.70 | XX |
| WVEXGK | | 0.00967 | 0.00045 | 0.59 | 0.00720 | -0.00007 | -0.11 | XX |
| X366CV | | 0.00970 | 0.00048 | 0.63 | 0.00748 | 0.00020 | 0.30 | CO |
| YQURVU | | 0.00940 | 0.00018 | 0.24 | 0.00757 | 0.00029 | 0.44 | CO |
| YZFTDP | | 0.00840 | -0.00082 | -1.09 | 0.00653 | -0.00074 | -1.12 | IC |
| ZD2N8V | X | 0.0134 | 0.00423 | 5.59 | 0.0125 | 0.00525 | 7.91 | OE |
| ZM9KVX | | 0.00781 | -0.00141 | -1.87 | 0.00587 | -0.00141 | -2.12 | OE |
| ZYLHZ3 | | 0.0104 | 0.00121 | 1.60 | 0.00820 | 0.00093 | 1.39 | OE |

Summary Statistics

| | Sample L69 | | Sample L70 | |
|--------------------------|------------|---------|------------|---------|
| Grand Means | 0.00922 | Percent | 0.00727 | Percent |
| Std Dev Btwn Labs | 0.00076 | Percent | 0.00066 | Percent |

Samples L69, L70 : AISI 1045, AISI 1045

Statistics based on 58 of 72 reporting participants

Key to Method Codes Reported by Participants

| | | | |
|----|---|----|---|
| AA | Spectrometry - Atomic Absorption (AAS) | AE | Spectrometry - Atomic Emission (AES) |
| CI | Combustion / IR | CL | Colorimetry |
| CO | Combustion | DR | Spectrometry - Direct Reading OE (DROES) |
| IC | Spectrometry - Inductively Coupled Plasma (ICP) | IR | IR (Absorption / Detection) |
| OE | Spectrometry - Optical Emission (OES) | XX | Please Indicate Method Used for Current Element |



Analysis 1612

Carbon & Low Alloy Steel, NITROGEN (N)
NITROGEN (N)

Comments on Assigned Data Flags for Test #1612

- 2AWLDB (X) - Data for both samples are low. Possible Systematic Error.
- 2GKXZT (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- 2KJ9VT (X) - Data for both samples are high. Possible Systematic Error.
- DJJEVB (M) - Participant did not submit data for sample L70.
- FTHWGX (X) - Data for both samples are extremely high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- MYL9FG (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample L70.
- NGYARV (X) - Data for both samples are low. Possible Systematic Error.
- NPC426 (X) - Extreme data.
- RZJ8HC (X) - Data for sample L69 are low and data for sample L70 are high. Inconsistent in testing between samples.
- T8Z3ZR (X) - Data for both samples are low. Possible Systematic Error.
- VM2NDX (X) - Data for both samples are extremely high. Possible Systematic Error. Inconsistent within the determinations of both samples.
- WRDR4Z (X) - Data for both samples are low. Possible Systematic Error.
- ZD2N8V (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample L70.

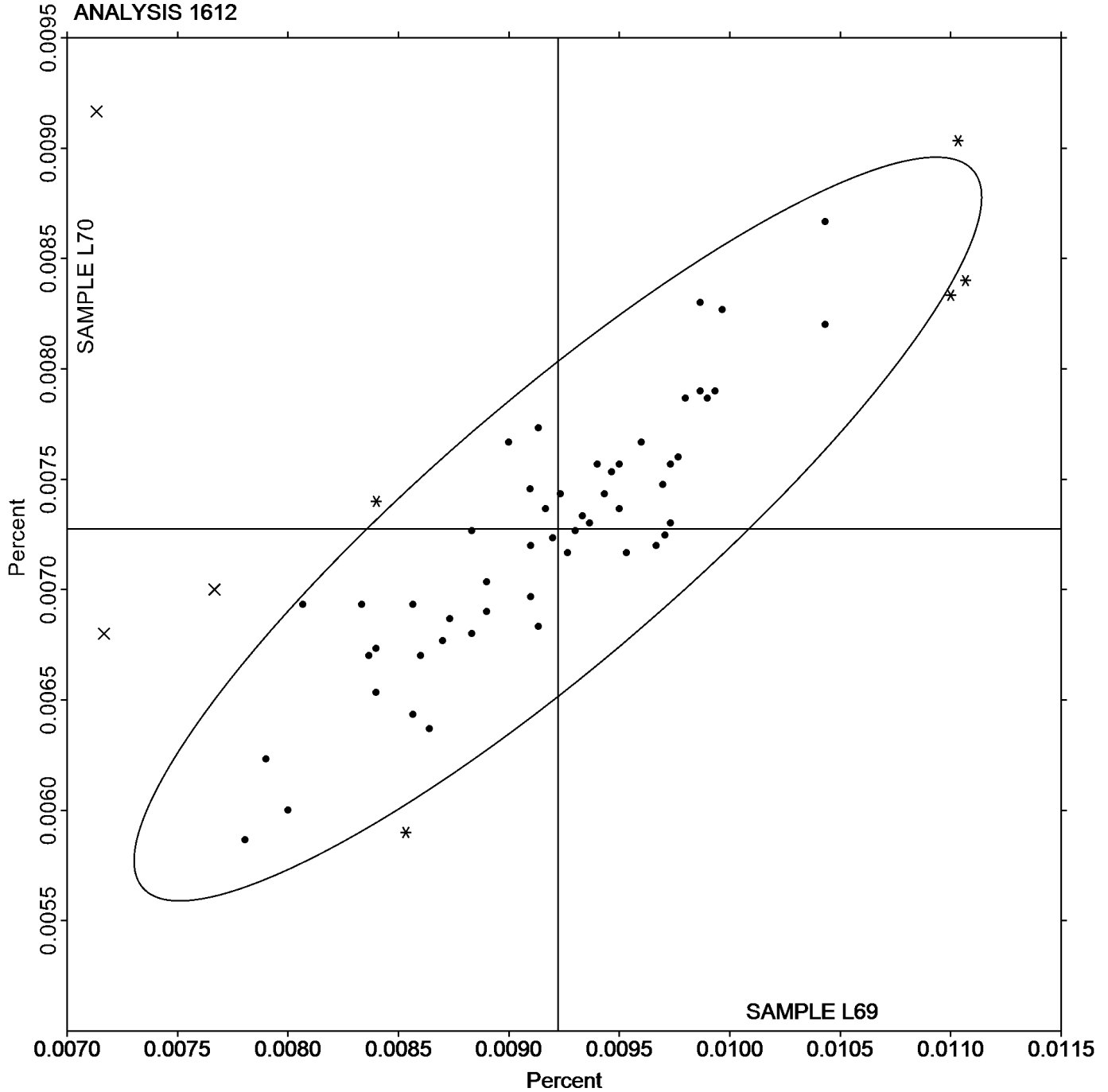


Analysis 1612

Carbon & Low Alloy Steel, NITROGEN (N)
NITROGEN (N)

SAMPLE L69
0.00922 Percent

SAMPLE L70
0.00727 Percent





Fasteners and Metals Interlaboratory Testing Program

Cycle 131

Analysis 1612

3rd Qtr 2020

Carbon & Low Alloy Steel, NITROGEN (N)

NITROGEN (N)

-End of Report-