

Aluminum Alloy MFG LLC
Grade Report

Date: 30-Jul-19 Time: 10:49

Sample Id: ██████████s #4880

Grade: A356.2

Out of Spec:

| | | | | | | | |
|------|--------|-------|--------|--------|--------|--------|--------|
| | Al | Si | Fe | Cu | Mn | Mg | Cr |
| +Tol | | | | | | | |
| High | | 7.50 | 0.120 | 0.10 | 0.050 | 0.450 | |
| Avg | 92.24 | 7.05 | 0.105 | 0.006 | 0.024 | 0.374 | <0.001 |
| Low | | 6.50 | | | | 0.30 | |
| -Tol | | | | | | | |
| | Ni | Zn | Sn | Ti | Pb | Be | Ca |
| +Tol | | | | | | | |
| High | | 0.050 | | 0.20 | | | |
| Avg | 0.006 | 0.008 | 0.0071 | 0.131 | 0.0086 | <0.000 | <0.000 |
| Low | | | | | | | |
| -Tol | | | | | | | |
| | Sr | V | Zr | Bi | In | Cd | Sb |
| +Tol | | | | | | | |
| High | | | | | | | |
| Avg | 0.0176 | 0.013 | <0.002 | <0.005 | 0.003 | <0.000 | <0.002 |
| Low | | | | | | | |
| -Tol | | | | | | | |
| | Co | Ga | B | Ag | OTE | | |
| +Tol | | | | | | | |
| High | | | | | 0.150 | | |
| Avg | <0.002 | 0.009 | 0.0024 | <0.000 | 0.043 | | |
| Low | | | | | | | |
| -Tol | | | | | | | |

Aluminum Alloy MFG LLC
Analytical Results

Date: 30-Jul-19 Time: 10:49
Sample ID: 2567
Alloy: A356.2
Type: 356

| | | | | | | | |
|-----|--------|-------|--------|---------|--------|---------|---------|
| Avg | Al | Si | Fe | Cu | Mn | Mg | Cr |
| | 92.24 | 7.05 | 0.105 | 0.006 | 0.024 | 0.374 | <0.001 |
| Avg | Ni | Zn | Sn | Ti | Pb | Be | Ca |
| | 0.006 | 0.008 | 0.0071 | 0.131 | 0.0086 | <0.0005 | <0.0005 |
| Avg | Sr | V | Zr | Bi | In | Cd | Sb |
| | 0.0176 | 0.013 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| Avg | Co | Ga | B | Ag | OTE | | |
| | <0.002 | 0.009 | 0.0024 | <0.0005 | 0.043 | | |

Aluminum Alloy MFG LLC

Analytical Results

Date: 30-Jul-19 Time: 10:49

Sample ID: 2567

Alloy: A356.2

Type: 356

| | Al | Si | Fe | Cu | Mn | Mg | Cr |
|-----|--------|--------|--------|--------|--------|--------|--------|
| 1 | 92.35 | 6.93 | 0.108 | <0.002 | 0.016 | 0.399 | <0.001 |
| 2 | 92.29 | 6.99 | 0.120 | 0.017 | 0.025 | 0.392 | 0.003 |
| 3 | 92.26 | 7.03 | 0.110 | <0.002 | 0.017 | 0.383 | <0.001 |
| 4 | 92.23 | 7.07 | 0.098 | <0.002 | 0.017 | 0.374 | <0.001 |
| 5 | 92.54 | 6.79 | 0.087 | <0.002 | 0.016 | 0.363 | <0.001 |
| 6 | 92.27 | 7.07 | 0.084 | <0.002 | 0.018 | 0.346 | <0.001 |
| 7 | 92.16 | 7.10 | 0.113 | 0.013 | 0.037 | 0.368 | <0.001 |
| 8 | 92.14 | 7.14 | 0.111 | 0.013 | 0.038 | 0.357 | <0.001 |
| 9 | 92.12 | 7.13 | 0.115 | 0.013 | 0.037 | 0.373 | <0.001 |
| 10 | 91.99 | 7.27 | 0.106 | 0.003 | 0.018 | 0.387 | <0.001 |
| Avg | 92.24 | 7.05 | 0.105 | 0.006 | 0.024 | 0.374 | <0.001 |
| SD | 0.1492 | 0.1300 | 0.0120 | 0.0067 | 0.0097 | 0.0165 | 0.0009 |
| RSD | 0.1618 | 1.8441 | 11.425 | 105.45 | 40.810 | 4.4087 | 187.57 |

| | Ni | Zn | Sn | Ti | Pb | Be | Ca |
|-----|--------|--------|--------|--------|--------|---------|---------|
| 1 | 0.004 | 0.005 | 0.0071 | 0.125 | 0.0075 | <0.0005 | <0.0005 |
| 2 | 0.007 | 0.014 | 0.0073 | 0.0933 | 0.0115 | <0.0005 | <0.0005 |
| 3 | 0.004 | 0.005 | 0.0070 | 0.128 | 0.0076 | <0.0005 | 0.0005 |
| 4 | 0.006 | 0.006 | 0.0071 | 0.138 | 0.0083 | <0.0005 | <0.0005 |
| 5 | 0.004 | 0.006 | 0.0073 | 0.141 | 0.0081 | <0.0005 | <0.0005 |
| 6 | 0.007 | 0.007 | 0.0073 | 0.132 | 0.0082 | <0.0005 | <0.0005 |
| 7 | 0.007 | 0.008 | 0.0071 | 0.137 | 0.0084 | <0.0005 | <0.0005 |
| 8 | 0.007 | 0.009 | 0.0071 | 0.129 | 0.0084 | <0.0005 | <0.0005 |
| 9 | 0.005 | 0.007 | 0.0072 | 0.135 | 0.0089 | <0.0005 | <0.0005 |
| 10 | 0.007 | 0.007 | 0.0069 | 0.147 | 0.0086 | <0.0005 | <0.0005 |
| Avg | 0.006 | 0.008 | 0.0071 | 0.131 | 0.0086 | <0.0005 | <0.0005 |
| SD | 0.0013 | 0.0027 | 0.0001 | 0.0146 | 0.0011 | 0.0000 | 0.0006 |
| RSD | 23.044 | 36.216 | 1.8210 | 11.170 | 13.023 | 1.0840 | -124.6 |

| | Sr | V | Zr | Bi | In | Cd | Sb |
|---|--------|-------|--------|--------|-------|---------|--------|
| 1 | 0.0215 | 0.015 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 2 | 0.0106 | 0.008 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 3 | 0.0230 | 0.015 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 4 | 0.0189 | 0.015 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 5 | 0.0139 | 0.015 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |

| | | | | | | | |
|-----|--------|--------|--------|--------|--------|---------|--------|
| 6 | 0.0169 | 0.014 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 7 | 0.0171 | 0.013 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 8 | 0.0151 | 0.013 | <0.002 | <0.005 | 0.004 | <0.0005 | <0.002 |
| 9 | 0.0174 | 0.013 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| 10 | 0.0213 | 0.015 | <0.002 | <0.005 | 0.004 | <0.0005 | <0.002 |
| Avg | 0.0176 | 0.013 | <0.002 | <0.005 | 0.003 | <0.0005 | <0.002 |
| SD | 0.0038 | 0.0021 | 0.0004 | 0.0003 | 0.0001 | 0.0001 | 0.0020 |
| RSD | 21.606 | 15.721 | 27.955 | 132.35 | 2.4858 | 113.41 | -46.04 |

| | Co | Ga | B | Ag | OTE |
|-----|--------|--------|---------|---------|--------|
| 1 | <0.002 | 0.009 | 0.0020 | <0.0005 | 0.045 |
| 2 | <0.002 | 0.008 | <0.0005 | <0.0005 | 0.032 |
| 3 | <0.002 | 0.009 | 0.0019 | <0.0005 | 0.049 |
| 4 | <0.002 | 0.009 | 0.0028 | <0.0005 | 0.046 |
| 5 | <0.002 | 0.008 | 0.0025 | <0.0005 | 0.038 |
| 6 | <0.002 | 0.008 | 0.0032 | <0.0005 | 0.045 |
| 7 | <0.002 | 0.009 | 0.0024 | <0.0005 | 0.043 |
| 8 | <0.002 | 0.008 | 0.0012 | <0.0005 | 0.039 |
| 9 | <0.002 | 0.009 | 0.0019 | <0.0005 | 0.039 |
| 10 | <0.002 | 0.010 | 0.0051 | <0.0005 | 0.056 |
| Avg | <0.002 | 0.009 | 0.0024 | <0.0005 | 0.043 |
| SD | 0.0010 | 0.0007 | 0.0012 | 0.0000 | 0.0066 |
| RSD | 929.06 | 7.4178 | 52.993 | 46.952 | 15.367 |