|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| L(m) | uL |  | m(kg) | um |  | d/L | T |
| 0.19968 | 0.00001 |  | 0.02982 | 0.00001 |  | 0.024762954 | 1.002 |
| 199.68 | (mm) |  | 29.82 | (g) |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| d123(mm) | d123(m) | d123+d0 | d平均 | (xi-x)2 | uda | udb | udc |
| 4.94 | 0.00494 | 0.004945 | 0.004944667 | 1.11111E-13 | 3.33333E-07 | 0.000002 | 2.03E-06 |
| 4.939 | 0.004939 | 0.004944 |  | 4.44444E-13 |  |  |  |
| 4.94 | 0.00494 | 0.004945 |  | 1.11111E-13 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| f1234(Hz) |  | f平均 | (xi-x)2 | ufa | ufb | ufc |  |
| 566 |  | 564.75 | 1.5625 | 0.783953655 | 1 | 1.270662557 |  |
| 564 |  |  | 0.5625 |  |  |  |  |
| 566 |  |  | 1.5625 |  |  |  |  |
| 563 |  |  | 3.0625 |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| E(Pa) | L | m | d | f | E(%) | uE |  |
| 2.04E+11 | 9.38707E+14 | 4.67672E+15 | 1.11882E+17 | 8.42102E+17 | 0.004803599 | 9.80E+08 |  |

Figure 钢棒

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| L(m) | uL |  | m(kg) | um |  | d/L | T |
| 0.19982 | 0.00001 |  | 0.03277 | 0.00001 |  | 0.024966 | 1.002 |
| 199.82 | (mm) |  | 32.77 | (g) |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| d123(mm) | d123(m) | d123+d0 | d平均 | (xi-x)2 | uda | udb | udc |
| 4.982 | 0.004982 | 0.004987 | 0.004989 | 2.78E-12 | 1.67E-06 | 0.000002 | 2.6E-06 |
| 4.982 | 0.004982 | 0.004987 |  | 2.78E-12 |  |  |  |
| 4.987 | 0.004987 | 0.004992 |  | 1.11E-11 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| f1234(Hz) |  | f平均 | (xi-x)2 | ufa | ufb | ufc |  |
| 372 |  | 371.75 | 0.0625 | 0.603807 | 1 | 1.168154 |  |
| 373 |  |  | 1.5625 |  |  |  |  |
| 371 |  |  | 0.5625 |  |  |  |  |
| 371 |  |  | 0.5625 |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| E(Pa) | L | m | d | f | E(%) | uE |  |
| 9.39E+10 | 1.99E+14 | 8.21E+14 | 3.84E+16 | 3.48E+17 | 0.006631 | 6.23E+08 |  |

Figure 2铜棒

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| L(m) | uL |  | m(kg) | um |  | d/L | T |
| L(m) | uL |  | m(kg) | um |  | d/L | T |
| 0.2001 | 0.00001 |  | 0.01075 | 0.00001 |  | 0.024719 | 1.002 |
| 200.1 | (mm) |  | 10.75 | (g) |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| d123(mm) | d123(m) | d123+d0 | d平均 | (xi-x)2 | uda | udb | udc |
| 4.938 | 0.004938 | 0.004943 | 0.004946 | 1.11E-11 | 3.33E-06 | 0.000002 | 3.89E-06 |
| 4.938 | 0.004938 | 0.004943 |  | 1.11E-11 |  |  |  |
| 4.948 | 0.004948 | 0.004953 |  | 4.44E-11 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| f1234(Hz) |  | f平均 | (xi-x)2 | ufa | ufb | ufc |  |
| 566 |  | 565.25 | 0.5625 | 1.482537 | 1 | 1.788272 |  |
| 563 |  |  | 5.0625 |  |  |  |  |
| 568 |  |  | 7.5625 |  |  |  |  |
| 564 |  |  | 1.5625 |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| E(Pa) | L | m | d | f | E(%) | uE |  |
| 7.40E+10 | 1.23E+14 | 4.74E+15 | 5.41E+16 | 2.19E+17 | 0.007128 | 5.28E+08 |  |

Figure 3细铝棒

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| L(m) | uL |  | m(kg) | um |  | d/L | T |
| 0.19982 | 0.00001 |  | 0.01522 | 0.00001 |  | 0.034564 | 1.008 |
| 199.82 | (mm) |  | 15.22 | (g) |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| d123(mm) | d123(m) | d123+d0 | d平均 | (xi-x)2 | uda | udb | udc |
| 6.91 | 0.00691 | 0.006915 | 0.006907 | 6.94E-11 | 6.01E-06 | 0.000002 | 6.33E-06 |
| 6.905 | 0.006905 | 0.00691 |  | 1.11E-11 |  |  |  |
| 6.89 | 0.00689 | 0.006895 |  | 1.36E-10 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| f1234(Hz) |  | f平均 | (xi-x)2 | ufa | ufb | ufc |  |
| 661 |  | 662.5 | 2.25 | 0.889757 | 1 | 1.338532 |  |
| 661 |  |  | 2.25 |  |  |  |  |
| 663 |  |  | 0.25 |  |  |  |  |
| 665 |  |  | 6.25 |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| E(Pa) | L | m | d | f | E(%) | uE |  |
| 3.79E+10 | 3.24E+13 | 6.21E+14 | 1.94E+16 | 2.35E+16 | 0.005499 | 2.09E+08 |  |

Figure 4粗铝棒

公式说明

1.计算L偏导=((1.6067\*A2^2\*D2/D7^4\*C13^2\*H2\*3)\*B2)^2

2.计算m偏导=((1.6067\*A2^3/D7^4\*C13^2\*H2)\*E2)^2

3.计算d偏导=(1.6067\*A2^3\*D2/D7^5\*C13^2\*H2\*H7\*4)^2

4.计算f偏导=(1.6067\*A2^3\*D2/D7^4\*C13\*2\*H2\*G13)^2