A2：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time/s | Position d/mm | Time/s | Position d/mm | Time/s | Position d/mm |
| 3 | -0.0521 | 42 | -0.0101 | 81 | 0.0129 |
| 6 | 0.5752 | 45 | 0.1862 | 84 | 0.0655 |
| 9 | -0.2385 | 48 | -0.0269 | 87 | 0.0916 |
| 12 | 0.6064 | 51 | 0.0372 | 90 | 0.0507 |
| 15 | 0.2144 | 54 | 0.0189 | 93 | 0.0616 |
| 18 | 0.1085 | 57 | -0.0329 | 96 | 0.0513 |
| 21 | 0.2510 | 60 | 0.0513 | 99 | 0.0821 |
| 24 | -0.0581 | 63 | 0.0725 | 102 | 0.0725 |
| 27 | -0.0114 | 66 | -0.0216 | 105 | 0.0377 |
| 30 | 0.3781 | 69 | -0.0354 | 108 | -0.0087 |
| 33 | 0.3224 | 72 | 0.0948 | 111 | 0.0157 |
| 36 | 0.3067 | 75 | 0.0683 | 115 | -0.0001 |
| 39 | -0.1424 | 78 | 0.0577 | 117 | 0.0160 |
|  |  |  |  | 120 | 0.0072 |

A3:

|  |  |  |  |
| --- | --- | --- | --- |
| d/mm | /mm | /mm | standard deviation |
| 0.0948 | 0.62221 | 0.032579 | 0.00602465 |
| 0.0683 | 0.006079 |
| 0.0577 | -0.004521 |
| 0.0655 | 0.003279 |
| 0.0916 | 0.029379 |
| 0.0507 | -0.011521 |
| 0.0616 | -0.000621 |
| 0.0513 | -0.010921 |
| 0.0821 | 0.019879 |
| 0.0725 | 0.025029 |

reference value of measurement (with standard deviation)：m

B1：

|  |  |  |
| --- | --- | --- |
| F/nN | d/mm | /mm |
| 0 | -0.0151 | -0.01112 |
| 0.0016 |
| -0.0314 |
| 0.0011 |
| -0.0137 |

|  |  |  |
| --- | --- | --- |
| F/nN | /mm | /mm |
| 1.80 | 0.20562 | 0.20800 |
| 0.21492 |
| 0.20182 |
| 0.21302 |
| 0.20462 |

|  |  |  |
| --- | --- | --- |
| F/nN | /mm | /mm |
| 3.60 | 0.41632 | 0.40940 |
| 0.40282 |
| 0.40292 |
| 0.41052 |
| 0.41442 |

|  |  |  |
| --- | --- | --- |
| F/nN | /mm | /mm |
| 5.40 | 0.60982 | 0.61630 |
| 0.61032 |
| 0.61612 |
| 0.62802 |
| 0.61722 |

|  |  |  |
| --- | --- | --- |
| F/nN | /mm | /mm |
| 7.20 | 0.81222 | 0.81232 |
| 0.80452 |
| 0.81102 |
| 0.81712 |
| 0.81672 |

|  |  |  |
| --- | --- | --- |
| F/nN | /mm | /mm |
| 9.00 | 0.99822 | 1.00450 |
| 1.00412 |
| 1.01082 |
| 1.00622 |
| 1.00312 |

B2：

|  |  |  |
| --- | --- | --- |
| F/nN | δ/m | /mm |
| 1.80 |  | 0.20800 |
| 3.60 |  | 0.40940 |
| 5.40 |  | 0.61630 |
| 7.20 |  | 0.81232 |
| 9.00 |  | 1.00450 |

B3：C1=5.004E-04

C1:

|  |  |  |
| --- | --- | --- |
| T/K | d/mm | /mm |
| 300 | -0.0545 | -0.02988 |
| 0.0003 |
| -0.0120 |
| -0.0658 |
| -0.0174 |

|  |  |  |
| --- | --- | --- |
| T/K | /mm | /mm |
| 301 | 0.30798 | 0.31148 |
| 0.31618 |
| 0.30958 |
| 0.30498 |
| 0.31868 |

|  |  |  |
| --- | --- | --- |
| T/K | /mm | /mm |
| 301.5 | 0.46838 | 0.46878 |
| 0.46718 |
| 0.47198 |
| 0.46458 |
| 0.47178 |

|  |  |  |
| --- | --- | --- |
| T/K | /mm | /mm |
| 302 | 0.63008 | 0.63634 |
| 0.64098 |
| 0.64328 |
| 0.63828 |
| 0.62908 |

|  |  |  |
| --- | --- | --- |
| T/K | /mm | /mm |
| 302.5 | 0.74638 | 0.75486 |
| 0.73828 |
| 0.76678 |
| 0.76518 |
| 0.75768 |

|  |  |  |
| --- | --- | --- |
| T/K | /mm | /mm |
| 303 | 0.91548 | 0.92276 |
| 0.92938 |
| 0.93248 |
| 0.91478 |
| 0.92168 |

C2:

|  |  |  |
| --- | --- | --- |
| T/K | /mm | δ/m |
| 301 | 3.1148E-04 | 1.5752E-07 |
| 301.5 | 4.6878E-04 | 2.3309E-07 |
| 302 | 6.3634E-04 | 3.1842E-07 |
| 302.5 | 7.5486E-04 | 3.7746E-07 |
| 303 | 9.2276E-04 | 4.6142E-07 |

Slope：1.504E-07

C3: E=5.78E10 Pa

D1:

|  |  |  |
| --- | --- | --- |
| Sample 0 | d/mm | /mm |
| 0.0375 | 0.00906 |
| -0.0154 |
| 0.0121 |
| 0.0191 |
| -0.0080 |

|  |  |  |
| --- | --- | --- |
| Sample 1 | /mm | /mm |
| -0.88706 | -0.87088 |
| -0.87956 |
| -0.87486 |
| -0.86156 |
| -0.85136 |

D2:

-8.02E-02  
D3：

|  |  |  |
| --- | --- | --- |
| Sample 2 | /mm | /mm |
| -0.62536 | -0.62112 |
| -0.61846 |
| -0.62496 |
| -0.61656 |
| -0.62026 |

|  |  |  |
| --- | --- | --- |
| Sample 3 | /mm | /mm |
| -0.21956 | -0.21610 |
| -0.21576 |
| -0.22476 |
| -0.21296 |
| -0.20746 |

D4：

S3：0.713%

S4：0.248%