

**MAXIMUM TEMPERATURE RANGE**

**Thermocouple Grade**

32 to 3092°F  
0 to 1700°C

**Extension Grade**

32 to 212°F  
0 to 100°C

**LIMITS OF ERROR**

(whichever is greater)

**Standard:** 0.5°C over 800°C

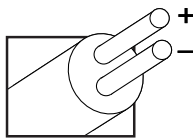
**Special:** NOT ESTABLISHED

**COMMENTS, BARE WIRE ENVIRONMENT:**

Oxidizing or Inert; Do Not Insert in Metal Tubes;  
Beware of Contamination; High Temperature;  
Common Use in Glass Industry

**TEMPERATURE IN DEGREES °C**

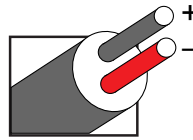
**REFERENCE JUNCTION AT 0°C**



**Thermocouple Grade**

**NONE ESTABLISHED**

**Platinum-30% Rhodium  
VS.  
Platinum-6% Rhodium**



**Extension Grade**

**Revised Thermocouple Reference Tables**

**TYPE B**  
Reference Tables  
N.I.S.T.  
Monograph 175  
Revised to ITS-90

Z

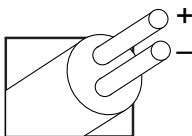
**Thermoelectric Voltage in Millivolts**

| °C  | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °C  | 0    | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | °C    |      |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| 0   | 0.000  | 0.000  | 0.000  | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.002 | -0.002 | -0.002 | 0   | 600  | 1.792 | 1.798 | 1.804 | 1.810 | 1.816 | 1.822 | 1.828 | 1.834 | 1.840 | 1.846 | 1.852 | 600  |
| 10  | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.003 | -0.003 | -0.003 | 10  | 610  | 1.852 | 1.858 | 1.864 | 1.870 | 1.876 | 1.882 | 1.888 | 1.894 | 1.901 | 1.907 | 1.913 | 610  |
| 20  | -0.003 | -0.003 | -0.003 | -0.003 | -0.003 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | 20  | 620  | 1.913 | 1.919 | 1.925 | 1.931 | 1.937 | 1.944 | 1.950 | 1.956 | 1.962 | 1.968 | 1.975 | 620  |
| 30  | -0.002 | -0.002 | -0.002 | -0.002 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | 0.000  | 30  | 630  | 1.975 | 1.981 | 1.987 | 1.993 | 1.999 | 2.006 | 2.012 | 2.018 | 2.025 | 2.031 | 2.037 | 630  |
| 40  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.001  | 0.001  | 0.001  | 0.002  | 0.002  | 0.002  | 40  | 640  | 2.037 | 2.043 | 2.050 | 2.056 | 2.062 | 2.069 | 2.075 | 2.082 | 2.088 | 2.094 | 2.101 | 640  |
| 50  | 0.002  | 0.003  | 0.003  | 0.003  | 0.004  | 0.004  | 0.004  | 0.005  | 0.005  | 0.006  | 0.006  | 50  | 650  | 2.101 | 2.107 | 2.113 | 2.120 | 2.126 | 2.133 | 2.139 | 2.146 | 2.152 | 2.158 | 2.165 | 650  |
| 60  | 0.006  | 0.007  | 0.007  | 0.008  | 0.008  | 0.009  | 0.009  | 0.010  | 0.010  | 0.011  | 0.011  | 60  | 660  | 2.165 | 2.171 | 2.178 | 2.184 | 2.191 | 2.197 | 2.204 | 2.210 | 2.217 | 2.224 | 2.230 | 660  |
| 70  | 0.011  | 0.012  | 0.012  | 0.013  | 0.014  | 0.014  | 0.015  | 0.015  | 0.016  | 0.017  | 0.017  | 70  | 670  | 2.230 | 2.237 | 2.243 | 2.250 | 2.256 | 2.263 | 2.270 | 2.276 | 2.283 | 2.289 | 2.296 | 670  |
| 80  | 0.017  | 0.018  | 0.019  | 0.020  | 0.020  | 0.021  | 0.022  | 0.022  | 0.023  | 0.024  | 0.025  | 80  | 680  | 2.296 | 2.303 | 2.309 | 2.316 | 2.323 | 2.329 | 2.336 | 2.343 | 2.350 | 2.356 | 2.363 | 680  |
| 90  | 0.025  | 0.026  | 0.026  | 0.027  | 0.028  | 0.029  | 0.030  | 0.031  | 0.031  | 0.032  | 0.033  | 90  | 690  | 2.363 | 2.370 | 2.376 | 2.383 | 2.390 | 2.397 | 2.403 | 2.410 | 2.417 | 2.424 | 2.431 | 690  |
| 100 | 0.033  | 0.034  | 0.035  | 0.036  | 0.037  | 0.038  | 0.039  | 0.040  | 0.041  | 0.042  | 0.043  | 100 | 700  | 2.431 | 2.437 | 2.444 | 2.451 | 2.458 | 2.465 | 2.472 | 2.479 | 2.485 | 2.492 | 2.499 | 700  |
| 110 | 0.043  | 0.044  | 0.045  | 0.046  | 0.047  | 0.048  | 0.049  | 0.050  | 0.051  | 0.052  | 0.053  | 110 | 710  | 2.499 | 2.506 | 2.513 | 2.520 | 2.527 | 2.534 | 2.541 | 2.548 | 2.555 | 2.562 | 2.569 | 710  |
| 120 | 0.053  | 0.055  | 0.056  | 0.057  | 0.058  | 0.059  | 0.060  | 0.060  | 0.062  | 0.063  | 0.064  | 120 | 720  | 2.569 | 2.576 | 2.583 | 2.590 | 2.597 | 2.604 | 2.611 | 2.618 | 2.625 | 2.632 | 2.639 | 720  |
| 130 | 0.065  | 0.066  | 0.068  | 0.069  | 0.070  | 0.072  | 0.073  | 0.074  | 0.075  | 0.077  | 0.078  | 130 | 730  | 2.639 | 2.646 | 2.653 | 2.660 | 2.667 | 2.674 | 2.681 | 2.688 | 2.696 | 2.703 | 2.710 | 730  |
| 140 | 0.078  | 0.079  | 0.081  | 0.082  | 0.084  | 0.085  | 0.086  | 0.088  | 0.089  | 0.091  | 0.092  | 140 | 740  | 2.710 | 2.717 | 2.724 | 2.731 | 2.738 | 2.746 | 2.753 | 2.760 | 2.767 | 2.775 | 2.782 | 740  |
| 150 | 0.092  | 0.094  | 0.095  | 0.096  | 0.098  | 0.099  | 0.101  | 0.102  | 0.104  | 0.106  | 0.107  | 150 | 750  | 2.782 | 2.789 | 2.796 | 2.803 | 2.811 | 2.818 | 2.825 | 2.833 | 2.840 | 2.847 | 2.854 | 750  |
| 160 | 0.107  | 0.109  | 0.110  | 0.112  | 0.113  | 0.115  | 0.117  | 0.118  | 0.120  | 0.122  | 0.123  | 160 | 760  | 2.854 | 2.862 | 2.869 | 2.876 | 2.884 | 2.891 | 2.898 | 2.906 | 2.913 | 2.921 | 2.928 | 760  |
| 170 | 0.123  | 0.125  | 0.127  | 0.128  | 0.130  | 0.132  | 0.134  | 0.135  | 0.137  | 0.139  | 0.141  | 170 | 770  | 2.928 | 2.935 | 2.943 | 2.950 | 2.958 | 2.965 | 2.973 | 2.980 | 2.987 | 2.995 | 3.002 | 770  |
| 180 | 0.141  | 0.142  | 0.144  | 0.146  | 0.148  | 0.150  | 0.151  | 0.153  | 0.155  | 0.157  | 0.159  | 180 | 780  | 3.002 | 3.010 | 3.017 | 3.025 | 3.032 | 3.040 | 3.047 | 3.055 | 3.062 | 3.070 | 3.078 | 780  |
| 190 | 0.159  | 0.161  | 0.163  | 0.165  | 0.166  | 0.168  | 0.170  | 0.172  | 0.174  | 0.176  | 0.178  | 190 | 790  | 3.078 | 3.085 | 3.093 | 3.100 | 3.108 | 3.116 | 3.123 | 3.131 | 3.138 | 3.146 | 3.154 | 790  |
| 200 | 0.178  | 0.180  | 0.182  | 0.184  | 0.186  | 0.188  | 0.190  | 0.192  | 0.195  | 0.197  | 0.199  | 200 | 800  | 3.154 | 3.161 | 3.169 | 3.177 | 3.184 | 3.192 | 3.200 | 3.207 | 3.215 | 3.223 | 3.230 | 800  |
| 210 | 0.199  | 0.201  | 0.203  | 0.205  | 0.207  | 0.209  | 0.212  | 0.214  | 0.216  | 0.218  | 0.220  | 210 | 810  | 3.230 | 3.238 | 3.246 | 3.254 | 3.261 | 3.269 | 3.277 | 3.285 | 3.292 | 3.300 | 3.308 | 810  |
| 220 | 0.220  | 0.222  | 0.225  | 0.227  | 0.229  | 0.231  | 0.234  | 0.236  | 0.238  | 0.241  | 0.243  | 220 | 820  | 3.308 | 3.316 | 3.324 | 3.331 | 3.339 | 3.347 | 3.355 | 3.363 | 3.371 | 3.379 | 3.386 | 820  |
| 230 | 0.243  | 0.245  | 0.248  | 0.250  | 0.252  | 0.255  | 0.257  | 0.259  | 0.262  | 0.264  | 0.267  | 230 | 830  | 3.386 | 3.394 | 3.402 | 3.410 | 3.418 | 3.426 | 3.434 | 3.442 | 3.450 | 3.458 | 3.466 | 830  |
| 240 | 0.267  | 0.269  | 0.271  | 0.274  | 0.276  | 0.279  | 0.281  | 0.284  | 0.286  | 0.289  | 0.291  | 240 | 840  | 3.466 | 3.474 | 3.482 | 3.490 | 3.498 | 3.506 | 3.514 | 3.522 | 3.530 | 3.538 | 3.546 | 840  |
| 250 | 0.291  | 0.294  | 0.296  | 0.299  | 0.301  | 0.304  | 0.307  | 0.309  | 0.312  | 0.314  | 0.317  | 250 | 850  | 3.546 | 3.554 | 3.562 | 3.570 | 3.578 | 3.586 | 3.594 | 3.602 | 3.610 | 3.618 | 3.626 | 850  |
| 260 | 0.317  | 0.320  | 0.322  | 0.325  | 0.328  | 0.330  | 0.333  | 0.336  | 0.338  | 0.341  | 0.344  | 260 | 860  | 3.626 | 3.634 | 3.643 | 3.651 | 3.659 | 3.667 | 3.675 | 3.683 | 3.692 | 3.700 | 3.708 | 860  |
| 270 | 0.344  | 0.347  | 0.349  | 0.352  | 0.355  | 0.358  | 0.360  | 0.363  | 0.366  | 0.369  | 0.372  | 270 | 870  | 3.708 | 3.716 | 3.724 | 3.732 | 3.741 | 3.749 | 3.757 | 3.765 | 3.774 | 3.782 | 3.790 | 870  |
| 280 | 0.372  | 0.375  | 0.377  | 0.380  | 0.383  | 0.386  | 0.389  | 0.392  | 0.395  | 0.398  | 0.401  | 280 | 880  | 3.790 | 3.798 | 3.807 | 3.815 | 3.823 | 3.832 | 3.840 | 3.848 | 3.857 | 3.865 | 3.873 | 880  |
| 290 | 0.401  | 0.404  | 0.407  | 0.410  | 0.413  | 0.416  | 0.419  | 0.422  | 0.425  | 0.428  | 0.431  | 290 | 890  | 3.873 | 3.882 | 3.890 | 3.898 | 3.907 | 3.915 | 3.923 | 3.932 | 3.940 | 3.949 | 3.957 | 890  |
| 300 | 0.431  | 0.434  | 0.437  | 0.440  | 0.443  | 0.446  | 0.449  | 0.452  | 0.455  | 0.458  | 0.462  | 300 | 900  | 3.957 | 3.965 | 3.974 | 3.982 | 3.991 | 3.999 | 4.008 | 4.016 | 4.024 | 4.033 | 4.041 | 900  |
| 310 | 0.462  | 0.465  | 0.468  | 0.471  | 0.474  | 0.478  | 0.481  | 0.484  | 0.487  | 0.490  | 0.494  | 310 | 910  | 4.041 | 4.050 | 4.058 | 4.067 | 4.075 | 4.084 | 4.093 | 4.101 | 4.110 | 4.118 | 4.127 | 910  |
| 320 | 0.494  | 0.497  | 0.500  | 0.503  | 0.507  | 0.510  | 0.513  | 0.517  | 0.520  | 0.523  | 0.527  | 320 | 920  | 4.127 | 4.135 | 4.144 | 4.152 | 4.161 | 4.170 | 4.178 | 4.187 | 4.195 | 4.204 | 4.213 | 920  |
| 330 | 0.527  | 0.530  | 0.533  | 0.537  | 0.540  | 0.544  | 0.547  | 0.550  | 0.554  | 0.557  | 0.561  | 330 | 930  | 4.213 | 4.221 | 4.230 | 4.239 | 4.247 | 4.256 | 4.265 | 4.273 | 4.282 | 4.291 | 4.299 | 930  |
| 340 | 0.561  | 0.564  | 0.568  | 0.571  | 0.575  | 0.578  | 0.582  | 0.585  | 0.589  | 0.592  | 0.596  | 340 | 940  | 4.299 | 4.308 | 4.317 | 4.326 | 4.334 | 4.343 | 4.352 | 4.360 | 4.369 | 4.378 | 4.387 | 940  |
| 350 | 0.596  | 0.599  | 0.603  | 0.607  | 0.610  | 0.614  | 0.617  | 0.621  | 0.625  | 0.628  | 0.632  | 350 | 950  | 4.387 | 4.396 | 4.404 | 4.413 | 4.422 | 4.431 | 4.440 | 4.448 | 4.457 | 4.466 | 4.475 | 950  |
| 360 | 0.632  | 0.636  | 0.639  | 0.643  | 0.647  | 0.650  | 0.654  | 0.658  | 0.662  | 0.665  | 0.669  | 360 | 960  | 4.475 | 4.484 | 4.493 | 4.501 | 4.510 | 4.519 | 4.528 | 4.537 | 4.546 | 4.555 | 4.564 | 960  |
| 370 | 0.669  | 0.673  | 0.677  | 0.680  | 0.684  | 0.688  | 0.692  | 0.696  | 0.700  | 0.703  | 0.707  | 370 | 970  | 4.564 | 4.573 | 4.582 | 4.591 | 4.599 | 4.608 | 4.617 | 4.626 | 4.635 | 4.644 | 4.653 | 970  |
| 380 | 0.707  | 0.711  | 0.715  | 0.719  | 0.723  | 0.727  | 0.731  | 0.735  | 0.738  | 0.742  | 0.746  | 380 | 980  | 4.653 | 4.662 | 4.671 | 4.680 | 4.689 | 4.698 | 4.707 | 4.716 | 4.725 | 4.734 | 4.743 | 980  |
| 390 | 0.746  | 0.750  | 0.754  | 0.758  | 0.762  | 0.766  | 0.770  | 0.774  | 0.778  | 0.782  | 0.787  | 390 | 990  | 4.743 | 4.753 | 4.762 | 4.771 | 4.780 | 4.789 | 4.798 | 4.807 | 4.816 | 4.825 | 4.834 | 990  |
| 400 | 0.787  | 0.791  | 0.795  | 0.799  | 0.803  | 0.807  | 0.811  | 0.815  | 0.819  | 0.824  | 0.828  | 400 | 1000 | 4.834 | 4.843 | 4.853 | 4.862 | 4.871 | 4.880 | 4.889 | 4.898 | 4.908 | 4.917 | 4.926 | 1000 |
| 410 | 0.828  | 0.832  | 0.836  | 0.840  | 0.844  | 0.849  | 0.853  | 0.857  | 0.861  | 0.866  | 0.870  | 410 | 1010 | 4.926 | 4.935 | 4.944 | 4.954 | 4.963 | 4.972 | 4.981 | 4.990 | 5.000 | 5.009 | 5.018 | 1010 |
| 420 | 0.870  | 0.874  | 0.878  | 0.883  | 0.887  | 0.891  | 0.896  | 0.900  | 0.904  | 0.909  | 0.913  | 420 | 1020 | 5.018 | 5.027 | 5.037 | 5.046 | 5.055 | 5.065 | 5.074 | 5.083 | 5.092 | 5.102 | 5.1   |      |

# Revised Thermocouple Reference Tables

# TYPE B

Reference Tables  
N.I.S.T.  
Monograph 175  
Revised to  
ITS-90

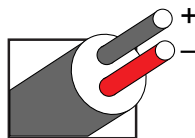


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VS.  
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Beware of Contamination; High Temperature;  
Common Use in Glass Industry

TEMPERATURE IN DEGREES °C  
REFERENCE JUNCTION AT 0°C

Thermoelectric Voltage in Millivolts

| °C   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °C   | °C   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °C   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 1200 | 6.786  | 6.797  | 6.807  | 6.818  | 6.828  | 6.838  | 6.849  | 6.859  | 6.869  | 6.880  | 6.890  | 1200 | 1550 | 10.679 | 10.691 | 10.703 | 10.714 | 10.726 | 10.738 | 10.749 | 10.761 | 10.773 | 10.784 | 10.796 | 1550 |
| 1210 | 6.890  | 6.901  | 6.911  | 6.922  | 6.932  | 6.942  | 6.953  | 6.963  | 6.974  | 6.984  | 6.995  | 1210 | 1560 | 10.796 | 10.808 | 10.819 | 10.831 | 10.843 | 10.854 | 10.866 | 10.877 | 10.889 | 10.901 | 10.913 | 1560 |
| 1220 | 6.995  | 7.005  | 7.016  | 7.026  | 7.037  | 7.047  | 7.058  | 7.068  | 7.079  | 7.089  | 7.100  | 1220 | 1570 | 10.913 | 10.924 | 10.936 | 10.948 | 10.959 | 10.971 | 10.983 | 10.994 | 11.006 | 11.018 | 11.029 | 1570 |
| 1230 | 7.100  | 7.110  | 7.121  | 7.131  | 7.142  | 7.152  | 7.163  | 7.173  | 7.184  | 7.194  | 7.205  | 1230 | 1580 | 11.029 | 11.041 | 11.053 | 11.064 | 11.076 | 11.088 | 11.099 | 11.111 | 11.123 | 11.134 | 11.146 | 1580 |
| 1240 | 7.205  | 7.216  | 7.226  | 7.237  | 7.247  | 7.258  | 7.269  | 7.279  | 7.290  | 7.300  | 7.311  | 1240 | 1590 | 11.146 | 11.158 | 11.169 | 11.181 | 11.193 | 11.205 | 11.216 | 11.228 | 11.240 | 11.251 | 11.263 | 1590 |
| 1250 | 7.311  | 7.322  | 7.332  | 7.343  | 7.353  | 7.364  | 7.375  | 7.385  | 7.396  | 7.407  | 7.417  | 1250 | 1600 | 11.263 | 11.275 | 11.286 | 11.298 | 11.310 | 11.321 | 11.333 | 11.345 | 11.357 | 11.368 | 11.380 | 1600 |
| 1260 | 7.417  | 7.428  | 7.439  | 7.449  | 7.460  | 7.471  | 7.482  | 7.492  | 7.503  | 7.514  | 7.524  | 1260 | 1610 | 11.380 | 11.392 | 11.403 | 11.415 | 11.427 | 11.438 | 11.450 | 11.462 | 11.474 | 11.485 | 11.497 | 1610 |
| 1270 | 7.524  | 7.535  | 7.546  | 7.557  | 7.567  | 7.578  | 7.589  | 7.600  | 7.610  | 7.621  | 7.632  | 1270 | 1620 | 11.497 | 11.509 | 11.520 | 11.532 | 11.544 | 11.555 | 11.567 | 11.579 | 11.591 | 11.602 | 11.614 | 1620 |
| 1280 | 7.632  | 7.643  | 7.653  | 7.664  | 7.675  | 7.686  | 7.697  | 7.707  | 7.718  | 7.729  | 7.740  | 1280 | 1630 | 11.614 | 11.626 | 11.637 | 11.649 | 11.661 | 11.673 | 11.684 | 11.696 | 11.708 | 11.719 | 11.731 | 1630 |
| 1290 | 7.740  | 7.751  | 7.761  | 7.772  | 7.783  | 7.794  | 7.805  | 7.816  | 7.827  | 7.837  | 7.848  | 1290 | 1640 | 11.731 | 11.743 | 11.754 | 11.766 | 11.778 | 11.790 | 11.801 | 11.813 | 11.825 | 11.836 | 11.848 | 1640 |
| 1300 | 7.848  | 7.859  | 7.870  | 7.881  | 7.892  | 7.903  | 7.914  | 7.924  | 7.935  | 7.946  | 7.957  | 1300 | 1650 | 11.848 | 11.860 | 11.871 | 11.883 | 11.895 | 11.907 | 11.918 | 11.930 | 11.942 | 11.953 | 11.965 | 1650 |
| 1310 | 7.957  | 7.968  | 7.979  | 7.990  | 8.001  | 8.012  | 8.023  | 8.034  | 8.045  | 8.056  | 8.066  | 1310 | 1660 | 11.965 | 11.977 | 11.988 | 12.000 | 12.012 | 12.024 | 12.035 | 12.047 | 12.059 | 12.070 | 12.082 | 1660 |
| 1320 | 8.066  | 8.077  | 8.088  | 8.099  | 8.110  | 8.121  | 8.132  | 8.143  | 8.154  | 8.165  | 8.176  | 1320 | 1670 | 12.082 | 12.094 | 12.105 | 12.117 | 12.129 | 12.141 | 12.152 | 12.164 | 12.176 | 12.187 | 12.199 | 1670 |
| 1330 | 8.176  | 8.187  | 8.198  | 8.209  | 8.220  | 8.231  | 8.242  | 8.253  | 8.264  | 8.275  | 8.286  | 1330 | 1680 | 12.199 | 12.211 | 12.222 | 12.234 | 12.246 | 12.257 | 12.269 | 12.281 | 12.292 | 12.304 | 12.316 | 1680 |
| 1340 | 8.286  | 8.298  | 8.309  | 8.320  | 8.331  | 8.342  | 8.353  | 8.364  | 8.375  | 8.386  | 8.397  | 1340 | 1690 | 12.316 | 12.327 | 12.339 | 12.351 | 12.363 | 12.374 | 12.386 | 12.398 | 12.409 | 12.421 | 12.433 | 1690 |
| 1350 | 8.397  | 8.408  | 8.419  | 8.430  | 8.441  | 8.453  | 8.464  | 8.475  | 8.486  | 8.497  | 8.508  | 1350 | 1700 | 12.433 | 12.444 | 12.456 | 12.468 | 12.479 | 12.491 | 12.503 | 12.514 | 12.526 | 12.538 | 12.549 | 1700 |
| 1360 | 8.508  | 8.519  | 8.530  | 8.542  | 8.553  | 8.564  | 8.575  | 8.586  | 8.597  | 8.608  | 8.620  | 1360 | 1710 | 12.549 | 12.561 | 12.572 | 12.584 | 12.596 | 12.607 | 12.619 | 12.631 | 12.642 | 12.654 | 12.666 | 1710 |
| 1370 | 8.620  | 8.631  | 8.642  | 8.653  | 8.664  | 8.675  | 8.687  | 8.698  | 8.709  | 8.720  | 8.731  | 1370 | 1720 | 12.666 | 12.677 | 12.689 | 12.701 | 12.712 | 12.724 | 12.736 | 12.747 | 12.759 | 12.770 | 12.782 | 1720 |
| 1380 | 8.731  | 8.743  | 8.754  | 8.765  | 8.776  | 8.787  | 8.799  | 8.810  | 8.821  | 8.832  | 8.844  | 1380 | 1730 | 12.782 | 12.794 | 12.805 | 12.817 | 12.829 | 12.840 | 12.852 | 12.863 | 12.875 | 12.887 | 12.898 | 1730 |
| 1390 | 8.844  | 8.855  | 8.866  | 8.877  | 8.889  | 8.900  | 8.911  | 8.922  | 8.934  | 8.945  | 8.956  | 1390 | 1740 | 12.898 | 12.910 | 12.921 | 12.933 | 12.945 | 12.956 | 12.968 | 12.980 | 12.991 | 13.003 | 13.014 | 1740 |
| 1400 | 8.956  | 8.967  | 8.979  | 8.990  | 9.001  | 9.013  | 9.024  | 9.035  | 9.047  | 9.058  | 9.069  | 1400 | 1750 | 13.014 | 13.026 | 13.037 | 13.049 | 13.061 | 13.072 | 13.084 | 13.095 | 13.107 | 13.119 | 13.130 | 1750 |
| 1410 | 9.069  | 9.080  | 9.092  | 9.103  | 9.114  | 9.126  | 9.137  | 9.148  | 9.160  | 9.171  | 9.182  | 1410 | 1760 | 13.130 | 13.142 | 13.153 | 13.165 | 13.176 | 13.188 | 13.200 | 13.211 | 13.223 | 13.234 | 13.246 | 1760 |
| 1420 | 9.182  | 9.194  | 9.205  | 9.216  | 9.228  | 9.239  | 9.251  | 9.262  | 9.273  | 9.285  | 9.296  | 1420 | 1770 | 13.246 | 13.257 | 13.269 | 13.280 | 13.292 | 13.304 | 13.315 | 13.327 | 13.338 | 13.350 | 13.361 | 1770 |
| 1430 | 9.296  | 9.307  | 9.319  | 9.330  | 9.342  | 9.353  | 9.364  | 9.376  | 9.387  | 9.398  | 9.410  | 1430 | 1780 | 13.361 | 13.373 | 13.384 | 13.396 | 13.407 | 13.419 | 13.430 | 13.442 | 13.453 | 13.465 | 13.476 | 1780 |
| 1440 | 9.410  | 9.421  | 9.433  | 9.444  | 9.456  | 9.467  | 9.478  | 9.490  | 9.501  | 9.513  | 9.524  | 1440 | 1790 | 13.476 | 13.488 | 13.499 | 13.511 | 13.522 | 13.534 | 13.545 | 13.557 | 13.568 | 13.580 | 13.591 | 1790 |
| 1450 | 9.524  | 9.536  | 9.547  | 9.558  | 9.570  | 9.581  | 9.593  | 9.604  | 9.616  | 9.627  | 9.639  | 1450 | 1800 | 13.591 | 13.603 | 13.614 | 13.626 | 13.637 | 13.649 | 13.660 | 13.672 | 13.683 | 13.694 | 13.706 | 1800 |
| 1460 | 9.639  | 9.650  | 9.662  | 9.673  | 9.684  | 9.696  | 9.707  | 9.719  | 9.730  | 9.742  | 9.753  | 1460 | 1810 | 13.706 | 13.717 | 13.729 | 13.740 | 13.752 | 13.763 | 13.775 | 13.786 | 13.797 | 13.809 | 13.820 | 1810 |
| 1470 | 9.753  | 9.765  | 9.776  | 9.788  | 9.799  | 9.811  | 9.822  | 9.834  | 9.845  | 9.857  | 9.868  | 1470 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1480 | 9.868  | 9.880  | 9.891  | 9.903  | 9.914  | 9.926  | 9.937  | 9.949  | 9.961  | 9.972  | 9.984  | 1480 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1490 | 9.984  | 9.995  | 10.007 | 10.018 | 10.030 | 10.041 | 10.053 | 10.064 | 10.076 | 10.088 | 10.099 | 1490 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1500 | 10.099 | 10.111 | 10.122 | 10.134 | 10.145 | 10.157 | 10.168 | 10.180 | 10.192 | 10.203 | 10.215 | 1500 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1510 | 10.215 | 10.226 | 10.238 | 10.249 | 10.261 | 10.273 | 10.284 | 10.296 | 10.307 | 10.319 | 10.331 | 1510 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1520 | 10.331 | 10.342 | 10.354 | 10.365 | 10.377 | 10.389 | 10.400 | 10.412 | 10.423 | 10.435 | 10.447 | 1520 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1530 | 10.447 | 10.458 | 10.470 | 10.482 | 10.493 | 10.505 | 10.516 | 10.528 | 10.540 | 10.551 | 10.563 | 1530 |      |        |        |        |        |        |        |        |        |        |        |        |      |
| 1540 | 10.563 | 10.575 | 10.586 | 10.598 | 10.609 | 10.621 | 10.633 | 10.644 | 10.656 | 10.668 | 10.679 | 1540 |      |        |        |        |        |        |        |        |        |        |        |        |      |

