

# J °F

## Type J Thermocouple— Iron/Copper-Nickel reference junctions at 32 °F

Thermoelectric Voltage in Millivolts

| °F   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| -340 | -8.030 | -8.041 | -8.052 | -8.063 | -8.074 | -8.085 | -8.095 |        |        |        |        | -340 |
| -330 | -7.915 | -7.927 | -7.938 | -7.950 | -7.962 | -7.973 | -7.985 | -7.996 | -8.008 | -8.019 | -8.030 | -330 |
| -320 | -7.791 | -7.804 | -7.816 | -7.829 | -7.841 | -7.854 | -7.866 | -7.878 | -7.890 | -7.903 | -7.915 | -320 |
| -310 | -7.659 | -7.672 | -7.686 | -7.699 | -7.713 | -7.726 | -7.739 | -7.752 | -7.765 | -7.778 | -7.791 | -310 |
| -300 | -7.519 | -7.534 | -7.548 | -7.562 | -7.576 | -7.590 | -7.604 | -7.618 | -7.632 | -7.645 | -7.659 | -300 |
| -290 | -7.373 | -7.388 | -7.403 | -7.417 | -7.432 | -7.447 | -7.462 | -7.476 | -7.491 | -7.505 | -7.519 | -290 |
| -280 | -7.219 | -7.234 | -7.250 | -7.265 | -7.281 | -7.296 | -7.312 | -7.327 | -7.342 | -7.357 | -7.373 | -280 |
| -270 | -7.058 | -7.074 | -7.090 | -7.107 | -7.123 | -7.139 | -7.155 | -7.171 | -7.187 | -7.203 | -7.219 | -270 |
| -260 | -6.890 | -6.907 | -6.924 | -6.941 | -6.958 | -6.975 | -6.991 | -7.008 | -7.025 | -7.041 | -7.058 | -260 |
| -250 | -6.716 | -6.734 | -6.752 | -6.769 | -6.787 | -6.804 | -6.821 | -6.839 | -6.856 | -6.873 | -6.890 | -250 |
| -240 | -6.536 | -6.555 | -6.573 | -6.591 | -6.609 | -6.627 | -6.645 | -6.663 | -6.681 | -6.699 | -6.716 | -240 |
| -230 | -6.351 | -6.370 | -6.388 | -6.407 | -6.426 | -6.444 | -6.463 | -6.481 | -6.500 | -6.518 | -6.536 | -230 |
| -220 | -6.159 | -6.179 | -6.198 | -6.217 | -6.236 | -6.256 | -6.275 | -6.294 | -6.313 | -6.332 | -6.351 | -220 |
| -210 | -5.962 | -5.982 | -6.002 | -6.022 | -6.042 | -6.061 | -6.081 | -6.101 | -6.120 | -6.140 | -6.159 | -210 |
| -200 | -5.760 | -5.781 | -5.801 | -5.821 | -5.842 | -5.862 | -5.882 | -5.902 | -5.922 | -5.942 | -5.962 | -200 |
| -190 | -5.553 | -5.574 | -5.595 | -5.616 | -5.637 | -5.657 | -5.678 | -5.699 | -5.719 | -5.740 | -5.760 | -190 |
| -180 | -5.341 | -5.363 | -5.384 | -5.405 | -5.426 | -5.448 | -5.469 | -5.490 | -5.511 | -5.532 | -5.553 | -180 |
| -170 | -5.125 | -5.146 | -5.168 | -5.190 | -5.212 | -5.233 | -5.255 | -5.277 | -5.298 | -5.320 | -5.341 | -170 |
| -160 | -4.903 | -4.926 | -4.948 | -4.970 | -4.992 | -5.015 | -5.037 | -5.059 | -5.081 | -5.103 | -5.125 | -160 |
| -150 | -4.678 | -4.701 | -4.724 | -4.746 | -4.769 | -4.791 | -4.814 | -4.836 | -4.859 | -4.881 | -4.903 | -150 |
| -140 | -4.449 | -4.472 | -4.495 | -4.518 | -4.541 | -4.564 | -4.587 | -4.610 | -4.633 | -4.655 | -4.678 | -140 |
| -130 | -4.215 | -4.239 | -4.262 | -4.286 | -4.309 | -4.332 | -4.356 | -4.379 | -4.402 | -4.425 | -4.449 | -130 |
| -120 | -3.978 | -4.002 | -4.026 | -4.050 | -4.073 | -4.097 | -4.121 | -4.144 | -4.168 | -4.192 | -4.215 | -120 |
| -110 | -3.737 | -3.761 | -3.786 | -3.810 | -3.834 | -3.858 | -3.882 | -3.906 | -3.930 | -3.954 | -3.978 | -110 |
| -100 | -3.493 | -3.517 | -3.542 | -3.566 | -3.591 | -3.615 | -3.640 | -3.664 | -3.688 | -3.713 | -3.737 | -100 |
| -90  | -3.245 | -3.270 | -3.295 | -3.320 | -3.344 | -3.369 | -3.394 | -3.419 | -3.443 | -3.468 | -3.493 | -90  |
| -80  | -2.994 | -3.019 | -3.044 | -3.070 | -3.095 | -3.120 | -3.145 | -3.170 | -3.195 | -3.220 | -3.245 | -80  |
| -70  | -2.740 | -2.766 | -2.791 | -2.817 | -2.842 | -2.867 | -2.893 | -2.918 | -2.943 | -2.969 | -2.994 | -70  |
| -60  | -2.483 | -2.509 | -2.535 | -2.560 | -2.586 | -2.612 | -2.638 | -2.663 | -2.689 | -2.714 | -2.740 | -60  |
| -50  | -2.223 | -2.249 | -2.275 | -2.301 | -2.327 | -2.353 | -2.379 | -2.405 | -2.431 | -2.457 | -2.483 | -50  |
| -40  | -1.961 | -1.987 | -2.013 | -2.040 | -2.066 | -2.092 | -2.118 | -2.145 | -2.171 | -2.197 | -2.223 | -40  |
| -30  | -1.695 | -1.722 | -1.749 | -1.775 | -1.802 | -1.828 | -1.855 | -1.881 | -1.908 | -1.934 | -1.961 | -30  |
| -20  | -1.428 | -1.455 | -1.482 | -1.508 | -1.535 | -1.562 | -1.589 | -1.615 | -1.642 | -1.669 | -1.695 | -20  |
| -10  | -1.158 | -1.185 | -1.212 | -1.239 | -1.266 | -1.293 | -1.320 | -1.347 | -1.374 | -1.401 | -1.428 | -10  |
| 0    | -0.886 | -0.913 | -0.940 | -0.967 | -0.995 | -1.022 | -1.049 | -1.076 | -1.104 | -1.131 | -1.158 | 0    |
| 0    | -0.886 | -0.858 | -0.831 | -0.803 | -0.776 | -0.749 | -0.721 | -0.694 | -0.666 | -0.639 | -0.611 | 0    |
| 10   | -0.611 | -0.583 | -0.556 | -0.528 | -0.501 | -0.473 | -0.445 | -0.418 | -0.390 | -0.362 | -0.334 | 10   |
| 20   | -0.334 | -0.307 | -0.279 | -0.251 | -0.223 | -0.195 | -0.168 | -0.140 | -0.112 | -0.084 | -0.056 | 20   |
| 30   | -0.056 | -0.028 | 0.000  | 0.028  | 0.056  | 0.084  | 0.112  | 0.140  | 0.168  | 0.196  | 0.225  | 30   |
| 40   | 0.225  | 0.253  | 0.281  | 0.309  | 0.337  | 0.365  | 0.394  | 0.422  | 0.450  | 0.478  | 0.507  | 40   |

**J °F****Type J Thermocouple**— Iron/Copper-Nickel  
reference junctions at 32 °F

Thermoelectric Voltage in Millivolts

| °F  | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F  |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|
| 50  | 0.507  | 0.535  | 0.563  | 0.592  | 0.620  | 0.649  | 0.677  | 0.705  | 0.734  | 0.762  | 0.791  | 50  |
| 60  | 0.791  | 0.819  | 0.848  | 0.876  | 0.905  | 0.933  | 0.962  | 0.991  | 1.019  | 1.048  | 1.076  | 60  |
| 70  | 1.076  | 1.105  | 1.134  | 1.162  | 1.191  | 1.220  | 1.249  | 1.277  | 1.306  | 1.335  | 1.364  | 70  |
| 80  | 1.364  | 1.392  | 1.421  | 1.450  | 1.479  | 1.508  | 1.537  | 1.566  | 1.594  | 1.623  | 1.652  | 80  |
| 90  | 1.652  | 1.681  | 1.710  | 1.739  | 1.768  | 1.797  | 1.826  | 1.855  | 1.884  | 1.913  | 1.942  | 90  |
| 100 | 1.942  | 1.972  | 2.001  | 2.030  | 2.059  | 2.088  | 2.117  | 2.146  | 2.175  | 2.205  | 2.234  | 100 |
| 110 | 2.234  | 2.263  | 2.292  | 2.322  | 2.351  | 2.380  | 2.409  | 2.439  | 2.468  | 2.497  | 2.527  | 110 |
| 120 | 2.527  | 2.556  | 2.585  | 2.615  | 2.644  | 2.673  | 2.703  | 2.732  | 2.762  | 2.791  | 2.821  | 120 |
| 130 | 2.821  | 2.850  | 2.880  | 2.909  | 2.938  | 2.968  | 2.997  | 3.027  | 3.057  | 3.086  | 3.116  | 130 |
| 140 | 3.116  | 3.145  | 3.175  | 3.204  | 3.234  | 3.264  | 3.293  | 3.323  | 3.353  | 3.382  | 3.412  | 140 |
| 150 | 3.412  | 3.442  | 3.471  | 3.501  | 3.531  | 3.560  | 3.590  | 3.620  | 3.650  | 3.679  | 3.709  | 150 |
| 160 | 3.709  | 3.739  | 3.769  | 3.798  | 3.828  | 3.858  | 3.888  | 3.918  | 3.948  | 3.977  | 4.007  | 160 |
| 170 | 4.007  | 4.037  | 4.067  | 4.097  | 4.127  | 4.157  | 4.187  | 4.217  | 4.246  | 4.276  | 4.306  | 170 |
| 180 | 4.306  | 4.336  | 4.366  | 4.396  | 4.426  | 4.456  | 4.486  | 4.516  | 4.546  | 4.576  | 4.606  | 180 |
| 190 | 4.606  | 4.636  | 4.666  | 4.696  | 4.726  | 4.757  | 4.787  | 4.817  | 4.847  | 4.877  | 4.907  | 190 |
| 200 | 4.907  | 4.937  | 4.967  | 4.997  | 5.028  | 5.058  | 5.088  | 5.118  | 5.148  | 5.178  | 5.209  | 200 |
| 210 | 5.209  | 5.239  | 5.269  | 5.299  | 5.329  | 5.360  | 5.390  | 5.420  | 5.450  | 5.480  | 5.511  | 210 |
| 220 | 5.511  | 5.541  | 5.571  | 5.602  | 5.632  | 5.662  | 5.692  | 5.723  | 5.753  | 5.783  | 5.814  | 220 |
| 230 | 5.814  | 5.844  | 5.874  | 5.905  | 5.935  | 5.965  | 5.996  | 6.026  | 6.056  | 6.087  | 6.117  | 230 |
| 240 | 6.117  | 6.147  | 6.178  | 6.208  | 6.239  | 6.269  | 6.299  | 6.330  | 6.360  | 6.391  | 6.421  | 240 |
| 250 | 6.421  | 6.452  | 6.482  | 6.512  | 6.543  | 6.573  | 6.604  | 6.634  | 6.665  | 6.695  | 6.726  | 250 |
| 260 | 6.726  | 6.756  | 6.787  | 6.817  | 6.848  | 6.878  | 6.909  | 6.939  | 6.970  | 7.000  | 7.031  | 260 |
| 270 | 7.031  | 7.061  | 7.092  | 7.122  | 7.153  | 7.184  | 7.214  | 7.245  | 7.275  | 7.306  | 7.336  | 270 |
| 280 | 7.336  | 7.367  | 7.398  | 7.428  | 7.459  | 7.489  | 7.520  | 7.550  | 7.581  | 7.612  | 7.642  | 280 |
| 290 | 7.642  | 7.673  | 7.704  | 7.734  | 7.765  | 7.795  | 7.826  | 7.857  | 7.887  | 7.918  | 7.949  | 290 |
| 300 | 7.949  | 7.979  | 8.010  | 8.041  | 8.071  | 8.102  | 8.133  | 8.163  | 8.194  | 8.225  | 8.255  | 300 |
| 310 | 8.255  | 8.286  | 8.317  | 8.347  | 8.378  | 8.409  | 8.439  | 8.470  | 8.501  | 8.532  | 8.562  | 310 |
| 320 | 8.562  | 8.593  | 8.624  | 8.654  | 8.685  | 8.716  | 8.747  | 8.777  | 8.808  | 8.839  | 8.869  | 320 |
| 330 | 8.869  | 8.900  | 8.931  | 8.962  | 8.992  | 9.023  | 9.054  | 9.085  | 9.115  | 9.146  | 9.177  | 330 |
| 340 | 9.177  | 9.208  | 9.238  | 9.269  | 9.300  | 9.331  | 9.362  | 9.392  | 9.423  | 9.454  | 9.485  | 340 |
| 350 | 9.485  | 9.515  | 9.546  | 9.577  | 9.608  | 9.639  | 9.669  | 9.700  | 9.731  | 9.762  | 9.793  | 350 |
| 360 | 9.793  | 9.823  | 9.854  | 9.885  | 9.916  | 9.947  | 9.977  | 10.008 | 10.039 | 10.070 | 10.101 | 360 |
| 370 | 10.101 | 10.131 | 10.162 | 10.193 | 10.224 | 10.255 | 10.285 | 10.316 | 10.347 | 10.378 | 10.409 | 370 |
| 380 | 10.409 | 10.440 | 10.470 | 10.501 | 10.532 | 10.563 | 10.594 | 10.625 | 10.655 | 10.686 | 10.717 | 380 |
| 390 | 10.717 | 10.748 | 10.779 | 10.810 | 10.840 | 10.871 | 10.902 | 10.933 | 10.964 | 10.995 | 11.025 | 390 |
| 400 | 11.025 | 11.056 | 11.087 | 11.118 | 11.149 | 11.180 | 11.211 | 11.241 | 11.272 | 11.303 | 11.334 | 400 |
| 410 | 11.334 | 11.365 | 11.396 | 11.426 | 11.457 | 11.488 | 11.519 | 11.550 | 11.581 | 11.612 | 11.642 | 410 |
| 420 | 11.642 | 11.673 | 11.704 | 11.735 | 11.766 | 11.797 | 11.828 | 11.858 | 11.889 | 11.920 | 11.951 | 420 |
| 430 | 11.951 | 11.982 | 12.013 | 12.044 | 12.074 | 12.105 | 12.136 | 12.167 | 12.198 | 12.229 | 12.260 | 430 |
| 440 | 12.260 | 12.290 | 12.321 | 12.352 | 12.383 | 12.414 | 12.445 | 12.476 | 12.506 | 12.537 | 12.568 | 440 |
| 450 | 12.568 | 12.599 | 12.630 | 12.661 | 12.691 | 12.722 | 12.753 | 12.784 | 12.815 | 12.846 | 12.877 | 450 |
| 460 | 12.877 | 12.907 | 12.938 | 12.969 | 13.000 | 13.031 | 13.062 | 13.093 | 13.123 | 13.154 | 13.185 | 460 |

**J °F****Type J Thermocouple**— Iron/Copper-Nickel  
*reference junctions at 32 °F*

Thermoelectric Voltage in Millivolts

| °F  | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F  |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|
| 470 | 13.185 | 13.216 | 13.247 | 13.278 | 13.308 | 13.339 | 13.370 | 13.401 | 13.432 | 13.463 | 13.494 | 470 |
| 480 | 13.494 | 13.524 | 13.555 | 13.586 | 13.617 | 13.648 | 13.679 | 13.709 | 13.740 | 13.771 | 13.802 | 480 |
| 490 | 13.802 | 13.833 | 13.864 | 13.894 | 13.925 | 13.956 | 13.987 | 14.018 | 14.049 | 14.079 | 14.110 | 490 |
| 500 | 14.110 | 14.141 | 14.172 | 14.203 | 14.233 | 14.264 | 14.295 | 14.326 | 14.357 | 14.388 | 14.418 | 500 |
| 510 | 14.418 | 14.449 | 14.480 | 14.511 | 14.542 | 14.573 | 14.603 | 14.634 | 14.665 | 14.696 | 14.727 | 510 |
| 520 | 14.727 | 14.757 | 14.788 | 14.819 | 14.850 | 14.881 | 14.911 | 14.942 | 14.973 | 15.004 | 15.035 | 520 |
| 530 | 15.035 | 15.065 | 15.096 | 15.127 | 15.158 | 15.189 | 15.219 | 15.250 | 15.281 | 15.312 | 15.343 | 530 |
| 540 | 15.343 | 15.373 | 15.404 | 15.435 | 15.466 | 15.496 | 15.527 | 15.558 | 15.589 | 15.620 | 15.650 | 540 |
| 550 | 15.650 | 15.681 | 15.712 | 15.743 | 15.773 | 15.804 | 15.835 | 15.866 | 15.897 | 15.927 | 15.958 | 550 |
| 560 | 15.958 | 15.989 | 16.020 | 16.050 | 16.081 | 16.112 | 16.143 | 16.173 | 16.204 | 16.235 | 16.266 | 560 |
| 570 | 16.266 | 16.296 | 16.327 | 16.358 | 16.389 | 16.419 | 16.450 | 16.481 | 16.512 | 16.542 | 16.573 | 570 |
| 580 | 16.573 | 16.604 | 16.635 | 16.665 | 16.696 | 16.727 | 16.758 | 16.788 | 16.819 | 16.850 | 16.881 | 580 |
| 590 | 16.881 | 16.911 | 16.942 | 16.973 | 17.003 | 17.034 | 17.065 | 17.096 | 17.126 | 17.157 | 17.188 | 590 |
| 600 | 17.188 | 17.219 | 17.249 | 17.280 | 17.311 | 17.341 | 17.372 | 17.403 | 17.434 | 17.464 | 17.495 | 600 |
| 610 | 17.495 | 17.526 | 17.556 | 17.587 | 17.618 | 17.649 | 17.679 | 17.710 | 17.741 | 17.771 | 17.802 | 610 |
| 620 | 17.802 | 17.833 | 17.863 | 17.894 | 17.925 | 17.955 | 17.986 | 18.017 | 18.048 | 18.078 | 18.109 | 620 |
| 630 | 18.109 | 18.140 | 18.170 | 18.201 | 18.232 | 18.262 | 18.293 | 18.324 | 18.354 | 18.385 | 18.416 | 630 |
| 640 | 18.416 | 18.446 | 18.477 | 18.508 | 18.538 | 18.569 | 18.600 | 18.630 | 18.661 | 18.692 | 18.722 | 640 |
| 650 | 18.722 | 18.753 | 18.784 | 18.814 | 18.845 | 18.876 | 18.906 | 18.937 | 18.968 | 18.998 | 19.029 | 650 |
| 660 | 19.029 | 19.060 | 19.090 | 19.121 | 19.152 | 19.182 | 19.213 | 19.244 | 19.274 | 19.305 | 19.336 | 660 |
| 670 | 19.336 | 19.366 | 19.397 | 19.428 | 19.458 | 19.489 | 19.520 | 19.550 | 19.581 | 19.612 | 19.642 | 670 |
| 680 | 19.642 | 19.673 | 19.704 | 19.734 | 19.765 | 19.795 | 19.826 | 19.857 | 19.887 | 19.918 | 19.949 | 680 |
| 690 | 19.949 | 19.979 | 20.010 | 20.041 | 20.071 | 20.102 | 20.132 | 20.163 | 20.194 | 20.224 | 20.255 | 690 |
| 700 | 20.255 | 20.286 | 20.316 | 20.347 | 20.378 | 20.408 | 20.439 | 20.469 | 20.500 | 20.531 | 20.561 | 700 |
| 710 | 20.561 | 20.592 | 20.623 | 20.653 | 20.684 | 20.715 | 20.745 | 20.776 | 20.806 | 20.837 | 20.868 | 710 |
| 720 | 20.868 | 20.898 | 20.929 | 20.960 | 20.990 | 21.021 | 21.052 | 21.082 | 21.113 | 21.143 | 21.174 | 720 |
| 730 | 21.174 | 21.205 | 21.235 | 21.266 | 21.297 | 21.327 | 21.358 | 21.389 | 21.419 | 21.450 | 21.480 | 730 |
| 740 | 21.480 | 21.511 | 21.542 | 21.572 | 21.603 | 21.634 | 21.664 | 21.695 | 21.726 | 21.756 | 21.787 | 740 |
| 750 | 21.787 | 21.817 | 21.848 | 21.879 | 21.909 | 21.940 | 21.971 | 22.001 | 22.032 | 22.063 | 22.093 | 750 |
| 760 | 22.093 | 22.124 | 22.154 | 22.185 | 22.216 | 22.246 | 22.277 | 22.308 | 22.338 | 22.369 | 22.400 | 760 |
| 770 | 22.400 | 22.430 | 22.461 | 22.492 | 22.522 | 22.553 | 22.584 | 22.614 | 22.645 | 22.676 | 22.706 | 770 |
| 780 | 22.706 | 22.737 | 22.768 | 22.798 | 22.829 | 22.860 | 22.890 | 22.921 | 22.952 | 22.982 | 23.013 | 780 |
| 790 | 23.013 | 23.044 | 23.074 | 23.105 | 23.136 | 23.166 | 23.197 | 23.228 | 23.258 | 23.289 | 23.320 | 790 |
| 800 | 23.320 | 23.350 | 23.381 | 23.412 | 23.442 | 23.473 | 23.504 | 23.535 | 23.565 | 23.596 | 23.627 | 800 |
| 810 | 23.627 | 23.657 | 23.688 | 23.719 | 23.749 | 23.780 | 23.811 | 23.842 | 23.872 | 23.903 | 23.934 | 810 |
| 820 | 23.934 | 23.964 | 23.995 | 24.026 | 24.057 | 24.087 | 24.118 | 24.149 | 24.180 | 24.210 | 24.241 | 820 |
| 830 | 24.241 | 24.272 | 24.303 | 24.333 | 24.364 | 24.395 | 24.426 | 24.456 | 24.487 | 24.518 | 24.549 | 830 |
| 840 | 24.549 | 24.579 | 24.610 | 24.641 | 24.672 | 24.702 | 24.733 | 24.764 | 24.795 | 24.826 | 24.856 | 840 |
| 850 | 24.856 | 24.887 | 24.918 | 24.949 | 24.979 | 25.010 | 25.041 | 25.072 | 25.103 | 25.134 | 25.164 | 850 |
| 860 | 25.164 | 25.195 | 25.226 | 25.257 | 25.288 | 25.318 | 25.349 | 25.380 | 25.411 | 25.442 | 25.473 | 860 |
| 870 | 25.473 | 25.504 | 25.534 | 25.565 | 25.596 | 25.627 | 25.658 | 25.689 | 25.720 | 25.750 | 25.781 | 870 |
| 880 | 25.781 | 25.812 | 25.843 | 25.874 | 25.905 | 25.936 | 25.967 | 25.998 | 26.029 | 26.059 | 26.090 | 880 |

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reference junctions at 32 °F

Thermoelectric Voltage in Millivolts

| °F   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 890  | 26.090 | 26.121 | 26.152 | 26.183 | 26.214 | 26.245 | 26.276 | 26.307 | 26.338 | 26.369 | 26.400 | 890  |
| 900  | 26.400 | 26.431 | 26.462 | 26.493 | 26.524 | 26.555 | 26.586 | 26.617 | 26.648 | 26.679 | 26.710 | 900  |
| 910  | 26.710 | 26.741 | 26.772 | 26.803 | 26.834 | 26.865 | 26.896 | 26.927 | 26.958 | 26.989 | 27.020 | 910  |
| 920  | 27.020 | 27.051 | 27.082 | 27.113 | 27.144 | 27.175 | 27.206 | 27.237 | 27.268 | 27.299 | 27.330 | 920  |
| 930  | 27.330 | 27.362 | 27.393 | 27.424 | 27.455 | 27.486 | 27.517 | 27.548 | 27.579 | 27.610 | 27.642 | 930  |
| 940  | 27.642 | 27.673 | 27.704 | 27.735 | 27.766 | 27.797 | 27.829 | 27.860 | 27.891 | 27.922 | 27.953 | 940  |
| 950  | 27.953 | 27.985 | 28.016 | 28.047 | 28.078 | 28.109 | 28.141 | 28.172 | 28.203 | 28.234 | 28.266 | 950  |
| 960  | 28.266 | 28.297 | 28.328 | 28.359 | 28.391 | 28.422 | 28.453 | 28.485 | 28.516 | 28.547 | 28.579 | 960  |
| 970  | 28.579 | 28.610 | 28.641 | 28.672 | 28.704 | 28.735 | 28.767 | 28.798 | 28.829 | 28.861 | 28.892 | 970  |
| 980  | 28.892 | 28.923 | 28.955 | 28.986 | 29.018 | 29.049 | 29.080 | 29.112 | 29.143 | 29.175 | 29.206 | 980  |
| 990  | 29.206 | 29.238 | 29.269 | 29.301 | 29.332 | 29.363 | 29.395 | 29.426 | 29.458 | 29.489 | 29.521 | 990  |
| 1000 | 29.521 | 29.552 | 29.584 | 29.616 | 29.647 | 29.679 | 29.710 | 29.742 | 29.773 | 29.805 | 29.836 | 1000 |
| 1010 | 29.836 | 29.868 | 29.900 | 29.931 | 29.963 | 29.995 | 30.026 | 30.058 | 30.089 | 30.121 | 30.153 | 1010 |
| 1020 | 30.153 | 30.184 | 30.216 | 30.248 | 30.279 | 30.311 | 30.343 | 30.375 | 30.406 | 30.438 | 30.470 | 1020 |
| 1030 | 30.470 | 30.502 | 30.533 | 30.565 | 30.597 | 30.629 | 30.660 | 30.692 | 30.724 | 30.756 | 30.788 | 1030 |
| 1040 | 30.788 | 30.819 | 30.851 | 30.883 | 30.915 | 30.947 | 30.979 | 31.011 | 31.043 | 31.074 | 31.106 | 1040 |
| 1050 | 31.106 | 31.138 | 31.170 | 31.202 | 31.234 | 31.266 | 31.298 | 31.330 | 31.362 | 31.394 | 31.426 | 1050 |
| 1060 | 31.426 | 31.458 | 31.490 | 31.522 | 31.554 | 31.586 | 31.618 | 31.650 | 31.682 | 31.714 | 31.746 | 1060 |
| 1070 | 31.746 | 31.778 | 31.811 | 31.843 | 31.875 | 31.907 | 31.939 | 31.971 | 32.003 | 32.035 | 32.068 | 1070 |
| 1080 | 32.068 | 32.100 | 32.132 | 32.164 | 32.196 | 32.229 | 32.261 | 32.293 | 32.325 | 32.358 | 32.390 | 1080 |
| 1090 | 32.390 | 32.422 | 32.455 | 32.487 | 32.519 | 32.551 | 32.584 | 32.616 | 32.648 | 32.681 | 32.713 | 1090 |
| 1100 | 32.713 | 32.746 | 32.778 | 32.810 | 32.843 | 32.875 | 32.908 | 32.940 | 32.973 | 33.005 | 33.037 | 1100 |
| 1110 | 33.037 | 33.070 | 33.102 | 33.135 | 33.167 | 33.200 | 33.232 | 33.265 | 33.298 | 33.330 | 33.363 | 1110 |
| 1120 | 33.363 | 33.395 | 33.428 | 33.460 | 33.493 | 33.526 | 33.558 | 33.591 | 33.624 | 33.656 | 33.689 | 1120 |
| 1130 | 33.689 | 33.722 | 33.754 | 33.787 | 33.820 | 33.853 | 33.885 | 33.918 | 33.951 | 33.984 | 34.016 | 1130 |
| 1140 | 34.016 | 34.049 | 34.082 | 34.115 | 34.148 | 34.180 | 34.213 | 34.246 | 34.279 | 34.312 | 34.345 | 1140 |
| 1150 | 34.345 | 34.378 | 34.411 | 34.444 | 34.476 | 34.509 | 34.542 | 34.575 | 34.608 | 34.641 | 34.674 | 1150 |
| 1160 | 34.674 | 34.707 | 34.740 | 34.773 | 34.806 | 34.840 | 34.873 | 34.906 | 34.939 | 34.972 | 35.005 | 1160 |
| 1170 | 35.005 | 35.038 | 35.071 | 35.104 | 35.138 | 35.171 | 35.204 | 35.237 | 35.270 | 35.304 | 35.337 | 1170 |
| 1180 | 35.337 | 35.370 | 35.403 | 35.437 | 35.470 | 35.503 | 35.536 | 35.570 | 35.603 | 35.636 | 35.670 | 1180 |
| 1190 | 35.670 | 35.703 | 35.736 | 35.770 | 35.803 | 35.837 | 35.870 | 35.903 | 35.937 | 35.970 | 36.004 | 1190 |
| 1200 | 36.004 | 36.037 | 36.071 | 36.104 | 36.138 | 36.171 | 36.205 | 36.238 | 36.272 | 36.305 | 36.339 | 1200 |
| 1210 | 36.339 | 36.373 | 36.406 | 36.440 | 36.473 | 36.507 | 36.541 | 36.574 | 36.608 | 36.642 | 36.675 | 1210 |
| 1220 | 36.675 | 36.709 | 36.743 | 36.777 | 36.810 | 36.844 | 36.878 | 36.912 | 36.945 | 36.979 | 37.013 | 1220 |
| 1230 | 37.013 | 37.047 | 37.081 | 37.114 | 37.148 | 37.182 | 37.216 | 37.250 | 37.284 | 37.318 | 37.352 | 1230 |
| 1240 | 37.352 | 37.386 | 37.420 | 37.454 | 37.488 | 37.522 | 37.556 | 37.590 | 37.624 | 37.658 | 37.692 | 1240 |
| 1250 | 37.692 | 37.726 | 37.760 | 37.794 | 37.828 | 37.862 | 37.896 | 37.930 | 37.964 | 37.999 | 38.033 | 1250 |
| 1260 | 38.033 | 38.067 | 38.101 | 38.135 | 38.169 | 38.204 | 38.238 | 38.272 | 38.306 | 38.341 | 38.375 | 1260 |
| 1270 | 38.375 | 38.409 | 38.444 | 38.478 | 38.512 | 38.546 | 38.581 | 38.615 | 38.650 | 38.684 | 38.718 | 1270 |
| 1280 | 38.718 | 38.753 | 38.787 | 38.822 | 38.856 | 38.890 | 38.925 | 38.959 | 38.994 | 39.028 | 39.063 | 1280 |
| 1290 | 39.063 | 39.097 | 39.132 | 39.166 | 39.201 | 39.235 | 39.270 | 39.305 | 39.339 | 39.374 | 39.408 | 1290 |
| 1300 | 39.408 | 39.443 | 39.478 | 39.512 | 39.547 | 39.582 | 39.616 | 39.651 | 39.686 | 39.720 | 39.755 | 1300 |

**J °F****Type J Thermocouple**— Iron/Copper-Nickel  
reference junctions at 32 °F

Thermoelectric Voltage in Millivolts

| °F   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 1310 | 39.755 | 39.790 | 39.825 | 39.859 | 39.894 | 39.929 | 39.964 | 39.998 | 40.033 | 40.068 | 40.103 | 1310 |
| 1320 | 40.103 | 40.138 | 40.173 | 40.207 | 40.242 | 40.277 | 40.312 | 40.347 | 40.382 | 40.417 | 40.452 | 1320 |
| 1330 | 40.452 | 40.487 | 40.522 | 40.556 | 40.591 | 40.626 | 40.661 | 40.696 | 40.731 | 40.766 | 40.801 | 1330 |
| 1340 | 40.801 | 40.836 | 40.872 | 40.907 | 40.942 | 40.977 | 41.012 | 41.047 | 41.082 | 41.117 | 41.152 | 1340 |
| 1350 | 41.152 | 41.187 | 41.222 | 41.258 | 41.293 | 41.328 | 41.363 | 41.398 | 41.433 | 41.469 | 41.504 | 1350 |
| 1360 | 41.504 | 41.539 | 41.574 | 41.610 | 41.645 | 41.680 | 41.715 | 41.751 | 41.786 | 41.821 | 41.856 | 1360 |
| 1370 | 41.856 | 41.892 | 41.927 | 41.962 | 41.998 | 42.033 | 42.068 | 42.104 | 42.139 | 42.174 | 42.210 | 1370 |
| 1380 | 42.210 | 42.245 | 42.281 | 42.316 | 42.351 | 42.387 | 42.422 | 42.458 | 42.493 | 42.528 | 42.564 | 1380 |
| 1390 | 42.564 | 42.599 | 42.635 | 42.670 | 42.706 | 42.741 | 42.777 | 42.812 | 42.848 | 42.883 | 42.919 | 1390 |
| 1400 | 42.919 | 42.954 | 42.990 | 43.025 | 43.061 | 43.096 | 43.132 | 43.167 | 43.203 | 43.239 | 43.274 | 1400 |
| 1410 | 43.274 | 43.310 | 43.346 | 43.381 | 43.417 | 43.452 | 43.488 | 43.524 | 43.559 | 43.595 | 43.631 | 1410 |
| 1420 | 43.631 | 43.667 | 43.702 | 43.738 | 43.774 | 43.809 | 43.845 | 43.881 | 43.917 | 43.953 | 43.988 | 1420 |
| 1430 | 43.988 | 44.024 | 44.060 | 44.096 | 44.131 | 44.167 | 44.203 | 44.239 | 44.275 | 44.310 | 44.346 | 1430 |
| 1440 | 44.346 | 44.382 | 44.418 | 44.454 | 44.490 | 44.525 | 44.561 | 44.597 | 44.633 | 44.669 | 44.705 | 1440 |
| 1450 | 44.705 | 44.741 | 44.777 | 44.812 | 44.848 | 44.884 | 44.920 | 44.956 | 44.992 | 45.028 | 45.064 | 1450 |
| 1460 | 45.064 | 45.099 | 45.135 | 45.171 | 45.207 | 45.243 | 45.279 | 45.315 | 45.351 | 45.387 | 45.423 | 1460 |
| 1470 | 45.423 | 45.458 | 45.494 | 45.530 | 45.566 | 45.602 | 45.638 | 45.674 | 45.710 | 45.746 | 45.782 | 1470 |
| 1480 | 45.782 | 45.818 | 45.853 | 45.889 | 45.925 | 45.961 | 45.997 | 46.033 | 46.069 | 46.105 | 46.141 | 1480 |
| 1490 | 46.141 | 46.177 | 46.212 | 46.248 | 46.284 | 46.320 | 46.356 | 46.392 | 46.428 | 46.464 | 46.500 | 1490 |
| 1500 | 46.500 | 46.535 | 46.571 | 46.607 | 46.643 | 46.679 | 46.715 | 46.751 | 46.786 | 46.822 | 46.858 | 1500 |
| 1510 | 46.858 | 46.894 | 46.930 | 46.966 | 47.001 | 47.037 | 47.073 | 47.109 | 47.145 | 47.181 | 47.216 | 1510 |
| 1520 | 47.216 | 47.252 | 47.288 | 47.324 | 47.359 | 47.395 | 47.431 | 47.467 | 47.503 | 47.538 | 47.574 | 1520 |
| 1530 | 47.574 | 47.610 | 47.646 | 47.681 | 47.717 | 47.753 | 47.788 | 47.824 | 47.860 | 47.896 | 47.931 | 1530 |
| 1540 | 47.931 | 47.967 | 48.003 | 48.038 | 48.074 | 48.110 | 48.145 | 48.181 | 48.217 | 48.252 | 48.288 | 1540 |
| 1550 | 48.288 | 48.324 | 48.359 | 48.395 | 48.430 | 48.466 | 48.502 | 48.537 | 48.573 | 48.608 | 48.644 | 1550 |
| 1560 | 48.644 | 48.679 | 48.715 | 48.750 | 48.786 | 48.822 | 48.857 | 48.893 | 48.928 | 48.964 | 48.999 | 1560 |
| 1570 | 48.999 | 49.034 | 49.070 | 49.105 | 49.141 | 49.176 | 49.212 | 49.247 | 49.283 | 49.318 | 49.353 | 1570 |
| 1580 | 49.353 | 49.389 | 49.424 | 49.460 | 49.495 | 49.530 | 49.566 | 49.601 | 49.636 | 49.672 | 49.707 | 1580 |
| 1590 | 49.707 | 49.742 | 49.778 | 49.813 | 49.848 | 49.883 | 49.919 | 49.954 | 49.989 | 50.024 | 50.060 | 1590 |
| 1600 | 50.060 | 50.095 | 50.130 | 50.165 | 50.200 | 50.235 | 50.271 | 50.306 | 50.341 | 50.376 | 50.411 | 1600 |
| 1610 | 50.411 | 50.446 | 50.481 | 50.517 | 50.552 | 50.587 | 50.622 | 50.657 | 50.692 | 50.727 | 50.762 | 1610 |
| 1620 | 50.762 | 50.797 | 50.832 | 50.867 | 50.902 | 50.937 | 50.972 | 51.007 | 51.042 | 51.077 | 51.112 | 1620 |
| 1630 | 51.112 | 51.147 | 51.181 | 51.216 | 51.251 | 51.286 | 51.321 | 51.356 | 51.391 | 51.425 | 51.460 | 1630 |
| 1640 | 51.460 | 51.495 | 51.530 | 51.565 | 51.599 | 51.634 | 51.669 | 51.704 | 51.738 | 51.773 | 51.808 | 1640 |
| 1650 | 51.808 | 51.843 | 51.877 | 51.912 | 51.947 | 51.981 | 52.016 | 52.051 | 52.085 | 52.120 | 52.154 | 1650 |
| 1660 | 52.154 | 52.189 | 52.224 | 52.258 | 52.293 | 52.327 | 52.362 | 52.396 | 52.431 | 52.465 | 52.500 | 1660 |
| 1670 | 52.500 | 52.534 | 52.569 | 52.603 | 52.638 | 52.672 | 52.707 | 52.741 | 52.776 | 52.810 | 52.844 | 1670 |
| 1680 | 52.844 | 52.879 | 52.913 | 52.947 | 52.982 | 53.016 | 53.050 | 53.085 | 53.119 | 53.153 | 53.188 | 1680 |
| 1690 | 53.188 | 53.222 | 53.256 | 53.290 | 53.325 | 53.359 | 53.393 | 53.427 | 53.462 | 53.496 | 53.530 | 1690 |
| 1700 | 53.530 | 53.564 | 53.598 | 53.632 | 53.667 | 53.701 | 53.735 | 53.769 | 53.803 | 53.837 | 53.871 | 1700 |
| 1710 | 53.871 | 53.905 | 53.939 | 53.973 | 54.007 | 54.041 | 54.075 | 54.109 | 54.143 | 54.177 | 54.211 | 1710 |
| 1720 | 54.211 | 54.245 | 54.279 | 54.313 | 54.347 | 54.381 | 54.415 | 54.449 | 54.483 | 54.516 | 54.550 | 1720 |
| 1730 | 54.550 | 54.584 | 54.618 | 54.652 | 54.686 | 54.719 | 54.753 | 54.787 | 54.821 | 54.855 | 54.888 | 1730 |

# J °F

## Type J Thermocouple— Iron/Copper-Nickel reference junctions at 32 °F

Thermoelectric Voltage in Millivolts

| °F   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 1740 | 54.888 | 54.922 | 54.956 | 54.990 | 55.023 | 55.057 | 55.091 | 55.124 | 55.158 | 55.192 | 55.225 | 1740 |
| 1750 | 55.225 | 55.259 | 55.293 | 55.326 | 55.360 | 55.393 | 55.427 | 55.461 | 55.494 | 55.528 | 55.561 | 1750 |
| 1760 | 55.561 | 55.595 | 55.628 | 55.662 | 55.695 | 55.729 | 55.762 | 55.796 | 55.829 | 55.863 | 55.896 | 1760 |
| 1770 | 55.896 | 55.930 | 55.963 | 55.997 | 56.030 | 56.063 | 56.097 | 56.130 | 56.164 | 56.197 | 56.230 | 1770 |
| 1780 | 56.230 | 56.264 | 56.297 | 56.330 | 56.364 | 56.397 | 56.430 | 56.464 | 56.497 | 56.530 | 56.564 | 1780 |
| 1790 | 56.564 | 56.597 | 56.630 | 56.663 | 56.697 | 56.730 | 56.763 | 56.796 | 56.829 | 56.863 | 56.896 | 1790 |
| 1800 | 56.896 | 56.929 | 56.962 | 56.995 | 57.028 | 57.062 | 57.095 | 57.128 | 57.161 | 57.194 | 57.227 | 1800 |
| 1810 | 57.227 | 57.260 | 57.293 | 57.326 | 57.360 | 57.393 | 57.426 | 57.459 | 57.492 | 57.525 | 57.558 | 1810 |
| 1820 | 57.558 | 57.591 | 57.624 | 57.657 | 57.690 | 57.723 | 57.756 | 57.789 | 57.822 | 57.855 | 57.888 | 1820 |
| 1830 | 57.888 | 57.920 | 57.953 | 57.986 | 58.019 | 58.052 | 58.085 | 58.118 | 58.151 | 58.184 | 58.217 | 1830 |
| 1840 | 58.217 | 58.249 | 58.282 | 58.315 | 58.348 | 58.381 | 58.414 | 58.446 | 58.479 | 58.512 | 58.545 | 1840 |
| 1850 | 58.545 | 58.578 | 58.610 | 58.643 | 58.676 | 58.709 | 58.741 | 58.774 | 58.807 | 58.840 | 58.872 | 1850 |
| 1860 | 58.872 | 58.905 | 58.938 | 58.971 | 59.003 | 59.036 | 59.069 | 59.101 | 59.134 | 59.167 | 59.199 | 1860 |
| 1870 | 59.199 | 59.232 | 59.265 | 59.297 | 59.330 | 59.363 | 59.395 | 59.428 | 59.460 | 59.493 | 59.526 | 1870 |
| 1880 | 59.526 | 59.558 | 59.591 | 59.623 | 59.656 | 59.689 | 59.721 | 59.754 | 59.786 | 59.819 | 59.851 | 1880 |
| 1890 | 59.851 | 59.884 | 59.916 | 59.949 | 59.982 | 60.014 | 60.047 | 60.079 | 60.112 | 60.144 | 60.177 | 1890 |
| 1900 | 60.177 | 60.209 | 60.242 | 60.274 | 60.307 | 60.339 | 60.371 | 60.404 | 60.436 | 60.469 | 60.501 | 1900 |
| 1910 | 60.501 | 60.534 | 60.566 | 60.599 | 60.631 | 60.663 | 60.696 | 60.728 | 60.761 | 60.793 | 60.826 | 1910 |
| 1920 | 60.826 | 60.858 | 60.890 | 60.923 | 60.955 | 60.987 | 61.020 | 61.052 | 61.085 | 61.117 | 61.149 | 1920 |
| 1930 | 61.149 | 61.182 | 61.214 | 61.246 | 61.279 | 61.311 | 61.343 | 61.376 | 61.408 | 61.440 | 61.473 | 1930 |
| 1940 | 61.473 | 61.505 | 61.537 | 61.570 | 61.602 | 61.634 | 61.667 | 61.699 | 61.731 | 61.763 | 61.796 | 1940 |
| 1950 | 61.796 | 61.828 | 61.860 | 61.893 | 61.925 | 61.957 | 61.989 | 62.022 | 62.054 | 62.086 | 62.118 | 1950 |
| 1960 | 62.118 | 62.151 | 62.183 | 62.215 | 62.247 | 62.280 | 62.312 | 62.344 | 62.376 | 62.409 | 62.441 | 1960 |
| 1970 | 62.441 | 62.473 | 62.505 | 62.537 | 62.570 | 62.602 | 62.634 | 62.666 | 62.699 | 62.731 | 62.763 | 1970 |
| 1980 | 62.763 | 62.795 | 62.827 | 62.860 | 62.892 | 62.924 | 62.956 | 62.988 | 63.020 | 63.053 | 63.085 | 1980 |
| 1990 | 63.085 | 63.117 | 63.149 | 63.181 | 63.214 | 63.246 | 63.278 | 63.310 | 63.342 | 63.374 | 63.406 | 1990 |
| 2000 | 63.406 | 63.439 | 63.471 | 63.503 | 63.535 | 63.567 | 63.599 | 63.632 | 63.664 | 63.696 | 63.728 | 2000 |
| 2010 | 63.728 | 63.760 | 63.792 | 63.824 | 63.856 | 63.889 | 63.921 | 63.953 | 63.985 | 64.017 | 64.049 | 2010 |
| 2020 | 64.049 | 64.081 | 64.113 | 64.146 | 64.178 | 64.210 | 64.242 | 64.274 | 64.306 | 64.338 | 64.370 | 2020 |
| 2030 | 64.370 | 64.402 | 64.435 | 64.467 | 64.499 | 64.531 | 64.563 | 64.595 | 64.627 | 64.659 | 64.691 | 2030 |
| 2040 | 64.691 | 64.723 | 64.756 | 64.788 | 64.820 | 64.852 | 64.884 | 64.916 | 64.948 | 64.980 | 65.012 | 2040 |
| 2050 | 65.012 | 65.044 | 65.076 | 65.109 | 65.141 | 65.173 | 65.205 | 65.237 | 65.269 | 65.301 | 65.333 | 2050 |
| 2060 | 65.333 | 65.365 | 65.397 | 65.429 | 65.461 | 65.493 | 65.525 | 65.557 | 65.590 | 65.622 | 65.654 | 2060 |
| 2070 | 65.654 | 65.686 | 65.718 | 65.750 | 65.782 | 65.814 | 65.846 | 65.878 | 65.910 | 65.942 | 65.974 | 2070 |
| 2080 | 65.974 | 66.006 | 66.038 | 66.070 | 66.102 | 66.134 | 66.166 | 66.199 | 66.231 | 66.263 | 66.295 | 2080 |
| 2090 | 66.295 | 66.327 | 66.359 | 66.391 | 66.423 | 66.455 | 66.487 | 66.519 | 66.551 | 66.583 | 66.615 | 2090 |
| 2100 | 66.615 | 66.647 | 66.679 | 66.711 | 66.743 | 66.775 | 66.807 | 66.839 | 66.871 | 66.903 | 66.935 | 2100 |
| 2110 | 66.935 | 66.967 | 66.999 | 67.031 | 67.063 | 67.095 | 67.127 | 67.159 | 67.191 | 67.223 | 67.255 | 2110 |
| 2120 | 67.255 | 67.287 | 67.319 | 67.351 | 67.383 | 67.415 | 67.447 | 67.479 | 67.511 | 67.543 | 67.575 | 2120 |
| 2130 | 67.575 | 67.607 | 67.639 | 67.671 | 67.703 | 67.735 | 67.767 | 67.799 | 67.831 | 67.863 | 67.895 | 2130 |
| 2140 | 67.895 | 67.927 | 67.959 | 67.991 | 68.023 | 68.055 | 68.087 | 68.119 | 68.150 | 68.182 | 68.214 | 2140 |
| 2150 | 68.214 | 68.246 | 68.278 | 68.310 | 68.342 | 68.374 | 68.406 | 68.438 | 68.470 | 68.502 | 68.534 | 2150 |

# J °F

**Type J Thermocouple**— Iron/Copper-Nickel  
*reference junctions at 32 °F*

Thermoelectric Voltage in Millivolts

| °F   | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | °F   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 2160 | 68.534 | 68.566 | 68.597 | 68.629 | 68.661 | 68.693 | 68.725 | 68.757 | 68.789 | 68.821 | 68.853 | 2160 |
| 2170 | 68.853 | 68.884 | 68.916 | 68.948 | 68.980 | 69.012 | 69.044 | 69.076 | 69.108 | 69.139 | 69.171 | 2170 |
| 2180 | 69.171 | 69.203 | 69.235 | 69.267 | 69.299 | 69.330 | 69.362 | 69.394 | 69.426 | 69.458 | 69.490 | 2180 |
| 2190 | 69.490 | 69.521 | 69.553 |        |        |        |        |        |        |        |        | 2190 |

| °F | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | °F |
|----|---|---|---|---|---|---|---|---|---|---|----|----|
|----|---|---|---|---|---|---|---|---|---|---|----|----|