Polinomios de interpolación termopares según ITS-90

- temperature range from -270 °C to 0 °C:

$$E = \sum_{i=0}^{14} d_i \cdot t_{68}^i$$

where: d0 = 0; d8 = 3.8648924201 x 10-15 ;
d1 = 3.8740773840 X 10-2 ; d9 = 2.8298678519 x 10-17 ;
d2 = 4.4123932482 X 10-5 ; d10 = 1.4281383349 X 10-19 ;
d3 = 1.1405238498 x 10-7 ; d11 = 4.8833254364 x 10-22 ;
d4 = 1.9974406568 x 10-8 ; d12 = 1.0803474683 x 10-24 ;
d5 = 9.0445401187 X 10-10 ; d13 = 1.3949291026 x 10-27 ;
d6 = 2.2766018504 x 10-1 1; d14 = 7.9795893156 x 10-31 ;
d7 = 3.6247409380 X 10-13 ;
- temperature range from 0 °C to 400 °C:

$$E = \sum_{i=0}^{8} d_i \cdot t_{68}^i$$

where: d0 = 0; d5 = 1.1031900550 x 10-11 ;
d1 = 3.8740773840 x 10-2 ; d6 = -3.0927581898 x 10-14 ;
d2 = 3.3190198092 x 10-5 ; d7 = 4.5653337165 x 10-17 ;
d3 = 2.0714183645 X 10-7 ; d8 = -2.7616878040 x 10-20 .
d4 = -2.1945834823 x 10-9 ;

2. Interpolation polynomial for type J thermocouples
(E in mV, t68 in °C)

- temperature range from -200 °C to 760 °C:

$$E = \sum_{i=0}^{7} d_i \cdot t_{68}^i$$

where: d0 = 0; d4 = 1.3348825735 X 10-10;
d1 = 5.0372753027 X 10-2; d5 = -1.7022405966 X 10-13;
d2 = 3.0425491284 X 10-5; d6 = 1.9416091001 X 10-16;
d3 = -8.5669750464 X 10-8; d7 = -9.6391844859 X 10-20;
- temperature range from 760 °C to 900 °C:

$$E = \sum_{i=0}^{5} d_i \cdot t_{68}^i$$

where: d0 = 2.9721751778 X 102; d3 = -3.2210174230 X 10-6;
d1 = -1.5059632873 x 100; d4 = 1.5949968788 X 10-9;
d2 = 3.2051064215 X 10-3; d5 = -3.1239801752 X 10-13.

3. Interpolation polynomial for type E thermocouples (E in mV, t68 in °C)

- temperature range from -270 °C to 0 °C:

$$E = \sum_{i=0}^{13} d_i \cdot t_{68}^i$$

where: d0 = 0; d7 = -1.0930767375 x 10-13;
d1 = 5.8695857799 X 10-2; d8 = -9.1784535039 X 10-16;
d2 = 5.1667517705 X 10-5; d9 = -5.2575158521 X 10-18;
d3 = -4.4652683347 X 10-7; d10 = -2.0169601996 X 10-20;
d4 = -1.7346270905 X 10-8; d11 = -4.9502138782 X 10-23;
d5 = -4.8719368427 X 10-10; d12 = -7.0177980633 X 10-26;
d6 = -8.8896550447 X 10-12; d13 = -4.3671808488 X 10-29;
202
- temperature range from 0 °C to 1000 °C:

$$E = \sum_{i=0}^{9} d_i \cdot t_{68}^i$$

where: d0 = 0; d5 = 1.5425922111 x 10-12;
d1 = 5.8695857799 X 10-2; d6 = -2.4850089136 x 10-15;
d2 = 4.3110945462 X 10-5; d7 = 2.3389721459 x 10-18;
d3 = 5.7220358202 x 10-8; d8 = -1.1946296815 X 10-21;
d4 = -5.4020668025 x 10-10; d9 = 2.5561127497 x 10-25.

4. Interpolation polynomial for type K thermocouples
(E in mV,1Gs in °C)
- temperature range from -270 °C to 0 °C:

$$E = \sum_{i=0}^{10} d_i \cdot t_{68}^i$$

where: d0 = 0; d6 = -2.4757917816 x 10-13;

d1 = 3.9475433139 X 10-2; d7 = -1.5585276173 x 10-15;
d2 = 2.7465251138 X 10-5; d8 = -5.9729921255 x 10-18;
d3 = -1.6565406716 x 10-7; d9 = -1.2688801216 x 10-20;
d4 = -1.5190912392 x 10-9; d10 = -1.1382797374 x 10-23;
d5 = -2.4581670924 x 10-11;
- temperature range from 0 °C to 1372 °C:

$$E = \sum_{i=0}^{8} d_i \cdot t_{68}^i + 0.125 \exp\left[-\frac{1}{2}\left(\frac{t_{68} - 127}{65} \right)^2 \right]$$

where: d0 = -1.8533063273 X 10-2; d5 = -3.5700231258 x 10-13;
d1 = 3.8918344612 x 10-2; d6 = 2.9932909136 x 10-16;
d2 = 1.6645154356 x 10-5; d7 = -1.2849848798 x 10-19;
d3 = -7.8702374448 x 10-8; d8 = 2.2239974336 x 10-23.
d4 = 2.2835785557 x 10-10;
203

5. Interpolation polynomial for type S thermocouples
(E in mV, t68 in °C)
- temperature range from -50 °C to 630.74 °C:

$$E = \sum_{i=0}^{6} a_i \cdot t_{68}^i$$

where: a0 = 0; a4 = 2.8452164949 x 10-11;
a1 = 5.3995782346 x 10-3; a5 = -2.2440584544 x 10-14;
a2 = 1.2519770000 x 10-5; a6 = 8.5054166936 x 10-18;
a3 = -2.2448217997 x 10-8;
- temperature range from 630.74 °C to 1064.43 °C:

$$E = \sum_{i=0}^{2} g_i \cdot t_{68}^i$$

where: g0 = -2.9824481615 x 10-1;
g1 = 8.2375528221 x 10-3;
g2 = 1.6453909942 X 10-6;
- temperature range from 1064.43 °C to 1665 °C:

$$E = \sum_{i=0}^{3} b_i \left(\frac{t_{68} - 1365}{300} \right)^i$$

where: b0 = 1.3943438677 x 101; b2 = -5.0281206140 x 10-3;
b1 = 3.6398686553; b3 = -4.2450546418 x 10-2.

6. Interpolation polynomial for type B thermocouples
(E in mV, t68 in °C)
- temperature range from 0 °C to 1820 °C:

$$E = \sum_{i=0}^{8} d_i \cdot t_{68}^i$$

where: d0 = 0; d5 = -3.1757800720 x 10-15;
d1 = -2.4674601620 x 10-4; d6 = 2.4010367459 x 10-18;
d2 = 5.9102111169 x 10-6; d7 = -9.0928148159 x 10-22;
d3 = -1.4307123430 x 10-9; d8 = 1.3299505137 x 10-25;
d4 = 2.1509149750 x 10-12;

7. Interpolation polynomial for type N thermocouples
(E in mV, t68 in °C, wire diameter 1.6 mm)
- temperature range from 0 °C to 1300 °C: .

$$E = \sum_{i=0}^{9} d_i \cdot t_{68}^i$$

where: d0 = 0; d5 = 3.652 666 5920 x 10-13;
d1 = 2.589 779 8582 x 10-2; d6 = -4.439 083 3504 x 10-16;
d2 = 1.665 612 7713 x 10-5; d7 = 3.155 338 2729 x 10-19;
d3 = 3.123 496 2101 x 10-8; d8 = -1.215 087 9468 x 10-22;
d4 = -1.724 813 0773 x 10-10; d9 = 1.955 719 7559 x 10-26.

8. Interpolation polynomial for type R thermocouples
(E in mV, t68 in °C)
- temperature range from -50 °C to 630.74 °C:

$$E = \sum_{i=0}^{7} a_i \cdot t_{68}^i$$

where. a0 = 0

a1 = 5.289 139 5059 x 10-3
a2 = 1.391 110 9947 x 10-5
a3 = -2.400 523 8430 x 10-8
a4 = 3.620 141 0595 x 10-11
a5 = -4.464 501 9036 x 10-14
a6 = 3.849 769 1865 x 10-17
a7 = -1.537 264 1559 x 10-20
205
- temperature range from 630.74 °C to 1064.43 °C:

$$E = \sum_{i=0}^{3} g_i \cdot t_{68}^i$$

where: g0 = -2.641 800 7025 x 10-1
g1 = 8.046 868 6747 x 10-3
g2 = 2.989 229 3723 x 10-6
g3 = -2.687 605 8617 x 10-10
- temperature range from 1064.43 °C to 1665 °C:

$$E = \sum_{i=0}^{3} b_i \cdot t_{68}^i$$

where: b0 = 1.490 170 2702 x 100
b1 = 2.863 986 7552 x 10-3
b2 = 8.082 363 1189 x 10-6
b3 = -1.933 847 7638 x 10-9
- temperature range from 1665 °C to 1769 °C:

$$E = \sum_{i=0}^{3} d_i \cdot t_{68}^i$$

where: d0 = 9.544 555 9010 x 101
d1 = -1.664 250 0359 x 10-1
d2 = 1.097 574 3239 x 10-4
d3 = -2.228 921 6980 x 10-8.