|  |
| --- |
|  |
| **Thermal and Mechanical Properties of Mylar (Polyethylene Terephthalate)** | | | | | | | | | | |  |
|  | **Density= 1.4 g/cc** | |  |  | | | | | | | | |
|  | | | | | | | | | | | | |
| **T (K)** | **Thermal Expansion** | | **Heat Capacity** | | **Thermal Conductivity** | | **Tensile Strength** | | **Yield Strength** | | **Young's Modulus** | |
|  | **(%)** |  | **(J/gK)** |  | **(W/cmK)** |  | (**Psi)** |  | **(Psi)** |  | **(Psi)** |  |
| 373 | 1.360 |  | 1.24E+00 |  | 2.17E-03 |  |  |  |  |  |  |  |
| 360 | 1.140 |  | 1.24E+00 |  | 1.69E-03 |  |  |  |  |  |  |  |
| 340 | 0.800 |  | 1.24E+00 |  | 1.23E-03 |  |  |  |  |  |  |  |
| 320 | 0.460 |  | 1.24E+00 |  | 9.60E-04 |  | 2.00E+04 |  |  |  | 1.00E+06 |  |
| 300 | 0.120 |  | 1.19E+00 |  | 8.05E-04 |  | 2.10E+04 |  |  |  | 1.01E+06 |  |
| 293 | 0.000 |  | 1.17E+00 |  | 7.69E-04 |  | 2.15E+04 |  |  |  | 1.02E+06 |  |
| 273 | -0.160 |  | 1.12E+00 |  | 7.06E-04 |  | 2.22E+04 |  |  |  | 1.03E+06 |  |
| 260 | -0.300 |  | 1.07E+00 |  | 6.89E-04 |  | 2.30E+04 |  |  |  | 1.04E+06 |  |
| 240 | -0.450 |  | 1.00E+00 |  | 6.96E-04 |  | 2.40E+04 |  |  |  | 1.06E+06 |  |
| 220 | -0.550 |  | 9.30E-01 |  | 7.39E-04 |  | 2.51E+04 |  |  |  | 1.10E+06 |  |
| 200 | -0.650 |  | 8.60E-01 |  | 8.16E-04 |  | 2.65E+04 |  |  |  | 1.16E+06 |  |
| 180 | -0.720 |  |  |  | 9.29E-04 |  | 2.82E+04 |  |  |  | 1.25E+06 |  |
| 160 | -0.780 |  |  |  | 1.07E-03 |  | 2.95E+04 |  |  |  | 1.35E+06 |  |
| 140 | -0.850 |  |  |  | 1.24E-03 |  | 3.10E+04 |  |  |  | 1.45E+06 |  |
| 120 | -0.900 |  |  |  | 1.41E-03 |  | 3.30E+04 |  |  |  | 1.57E+06 |  |
| 100 | -0.950 |  |  |  | 1.54E-03 |  | 3.48E+04 |  |  |  | 1.70E+06 |  |
| 80 | -1.000 |  |  |  | 1.57E-03 |  | 3.65E+04 |  |  |  | 1.85E+06 |  |
| 60 | -1.050 |  |  |  | 1.44E-03 |  | 3.85E+04 |  |  |  | 2.01E+06 |  |
| 40 | -1.070 |  |  |  | 1.16E-03 |  | 4.05E+04 |  |  |  |  |  |
| 20 | -1.120 |  |  |  | 7.35E-04 |  | 4.30E+04 |  |  |  |  |  |
| 10 | -1.140 |  |  |  | 4.79E-04 |  | 4.40E+04 |  |  |  |  |  |
| 4.2 | -1.150 |  |  |  | 3.78E-04 |  | 4.50E+04 |  |  |  |  |  |
|  |  |  |  |  |  |  | | | | | | |
|  |  |  |  |  |  |  | | | | | | |
|  | T(K) = Temperature in Kelvin, T(C) = Temperature in Celsius | | | | | |  | | | | | |
|  | T (C) = T (K) - 273 | |  | | | | | | | | | |
|  | | | | | | | | | | | | |
|  | Thermal Expansion (%) = 100 x [L(T) - L(293)] / L(293) | | | | |  | | | | | | |
|  | | | | | | | | | | | | |
|  | Heat Capacity [=] 1 J/gK = 0.23864 BTU/lbm/F | | | | |  | | | | | | |
|  | | | | | | | | | | | | |
|  | Thermal Conductivity [=] 1 W/cmK = 57.77 BTU/hr/ft/F | | | | |  | | | | | | |
|  | | | | | | | | | | | | |
|  | Tensile and Yield Strengths- lower bound values given.  http://www.yutopian.com/Yuan/prop/Mylar.html | | | | |  |  |  |  |  |  |  |