

Flexinol® Technical Data

If Flexinol® actuator wire is used within the guidelines then obtaining repeatable motion from the wire for tens of millions of cycles is reasonable. If higher stresses or strains are imposed, then the memory strain is likely to slowly decrease and good motion may be obtained for only hundreds or a few thousand of cycles. The permanent deformation, which occurs in the wire during cycling, is heavily a function of the stress imposed and the temperature under which the actuator wire is operating. Flexinol® wire has been specially processed to minimize this straining, but if the stress is too great or the temperature too high some permanent strain will occur. Since temperature is directly related to current density passing through the wire, care should be taken to heat, but not overheat, the actuator wire. The following chart gives rough guidelines as to how much current and force to expect with various wire sizes.

Diameter Size (Inches)	Resistance (Ohms/Inch)	Maximum Pull Force (grams)	Approximate* Current at Room Temperature (mA)	Contraction* Time (seconds)	Off Time LT=70° C Wire** (seconds)	Off Time HT=90° C Wire** (seconds)
0.0010	45.0	7	20	1	0.10	0.06
0.0015	21.0	17	30	1	0.25	0.09
0.002	12.0	35	50	1	0.3	0.1
0.003	5.0	80	100	1	0.5	0.2
0.004	3.0	150	180	1	0.8	0.4
0.005	1.8	230	250	1	1.6	0.9
0.006	1.3	330	400	1	2.0	1.2
0.008	0.8	590	610	1	3.5	2.2
0.010	0.5	930	1000	1	5.5	3.5
0.012	0.33	1250	1750	1	8.0	6.0
0.015	0.2	2000	2750	1	13.0	10.0
0.020	0.16	3562	4000	1	17.0	14.0

* The contraction time is directly related to current input. The figures used here are only approximate since room temperatures, air currents, and heat sinking of specific devices vary. On small diameter wires (≤ 0.006 " diameter) currents which heat the wire in 1 second can typically be left on without over-heating it. Both heating and cooling can be dramatically changed (see section 3 of the technical characteristics in the standard literature for more information.)

** Approximate cooling time.

