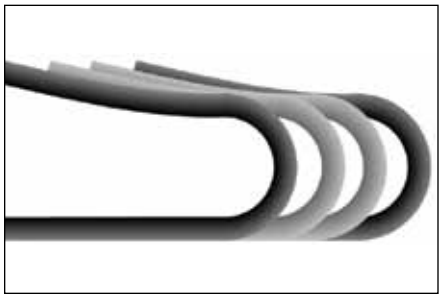
Common Flexing Applications

In applying a cable to a flexing application, you must consider the four types of flexing that may be encounter: Rolling Flex, Bending or Tic-Toc Flex, Torsional Flex, and Variable/Random Flex.

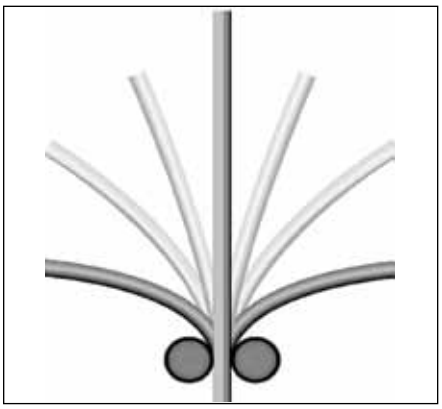
Rolling Flex

Rolling flex applications include linear motion associated with cable track systems or single axis slide apparatus. The most common type of rolling flex includes cable track systems where the cables are "managed" within an enclosed rolling motion carrier.



Bending Flex

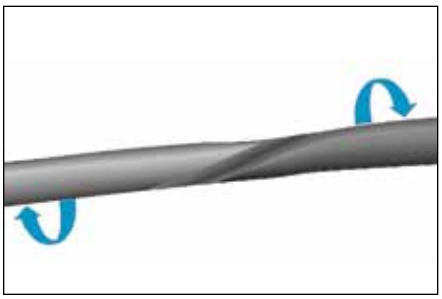
Bending or tick toc flex occurs when a cable is subjected to repetitive motion at a fixed point in the axis of the cable. The



bending moment of the cable is subjected to stress and fatigue from lateral motion in these applications.

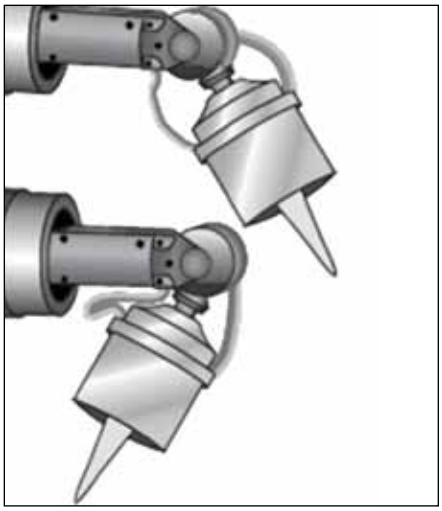
Torsional Flex

Torsional flexing applications occur when the cable is subjected to twisting forces, usually in a circular motion around the central axis of the cable. Robotic and pick/place apparatus are the most common applications subjecting cables to torsional stress.



Variable Flex

Variable flexing applications are random applications, which may occur in any number of flexing environments. Examples include articulation found in robotics, automated equipment, and hand-held devices.



Alpha Wire offers flexible cables products designed specifically for each of these types of flexure. In addition, Alpha's engineering staff can assist the user in the design of application specific cables to suit specific needs, or in the specification of an existing Alpha Wire product. A close examination of the flex requirements is an important first step in selecting product.

Technical Data

Cable Flex Test Capabilities Matrix

Flex Test Type	Applicable Standard	Travel Speed Or Cyclic Rate	Length Of Travel	Test Specimen	Bend Radius Or Mandrel Diameter	Sample Population	Acceptance Criteria
Rolling	Cable Track Alpha Rolling Flex	12.5 ft/s; 17 Cycles Per Minute	14 ft	28 ft	4.5" to 6.69"	1 Test Specimen Per Construction	Cycles to Failure
Bending/ Tic-Toc	MIL-C-13777G Section 3.7.2 and Section 4.5.4.1	30 Cycles Per Minute	42"@ ±90 degrees	42"	3/8" to 5/8"	3 Test Specimens Per Construction	Pass/Fail @ 1000 Cycles
Torsional	MIL-C-13777G Section 3.7.2 and Section 4.5.4.1	30 Cycles Per Minute	22"@ ±90 degrees	66"	3", 4.5", 6", 9"	3 Test Specimens Per Construction	Pass/Fail @ 3000 Cycles

Common Flexing Applications

Cable Family	Part No./Cable Description	Shield	Bend Radius	Cable Diameter	Bend Ratio: Radius/ Diameter	Failure	Cycle Count	Test Status
Xtra-Guard Continuous Flex Control	**85025** 20 AWG x 25 Conductors	NO	6.69	0.77	8.69:1	No	13,800,000	Complete
Xtra•Guard Continuous Flex Control	**85807CY** 18AWG x 7 Conductor	Yes	6.69	0.61	10.97:1	No	13,800,000	Test Complete
Xtra-Guard Continuous Flex Control	**85618** 16AWG x 18 Conductor	No	6.69	0.78	8.58:1	No	13,800,000	Test Complete
Xtra-Guard Continuous Flex Control	**85404CY** 14AWG x 4 Conductor	Yes	6.69	0.64	10.45:1	No	13,800,000	Test Complete
Xtra-Guard Continuous Flex Data	**86714CY** 22 AWG x 7 Pairs	Yes	4.5	0.51	8.82:1	No	14,500,000	Complete
Xtra-Guard Continuous Flex Data	**86325CY** 22 AWG x 25 Conductors	Yes	4.5	0.41	10.98:1	No	6,700,000	Complete
Series F	**F16017RW** 16 AWG x 17 Conductors	No	6.69	0.67	9.99:1	No	5,698,000	Complete
Series F	**F16025RW** 16 AWG x 25 Conductors	No	6.69	0.79	8.47:1	No	5,698,000	Complete
Series F	**F16022RW** 16 AWG x 22 Conductors	No	6.69	0.73	9.16:1	No	5,698,000	Complete
Series F	**F16012RW** 16 AWG x 12 Conductors	No	4.5	0.58	7.76:1	No	7,000,000	Complete
Series F	**F16033RW** 16 AWG x 33 Conductors	No	6.69	0.89	7.52:1	No	7,000,000	Complete
Series F	**F16017RW** 16 AWG x 17 Conductors	No	6.69	0.67	9.99:1	No	3,000,000	Complete
Series F	**F16033RW** 16 AWG x 33 Conductors	No	6.69	0.89	7.52:1	No	3,000,000	Complete
Series F	**F16022RW** 16 AWG x 22 Conductors	No	6.69	0.73	9.16:1	No	3,000,000	3,000,000
Series F	**F08004KW** 8 AWG x 4 Conductors	No	6.69	0.74	9.04:1	No	7,500,000	Track Failed
Series M	**M16122RW** 16 AWG x 22 Conductors	No	4.5	0.58	7.76:1	No	1,594,000	Complete
Series M	**M16133RW** 16 AWG x 33 Conductors	No	4.5	0.89	5.06:1	Yes	1,594,000	Complete
Series S	**S61223CY** 10 AWG x 4 Conductors 16 AWG x 2 Pairs	Yes	6.69	0.81	8.26:1	No	1,000,000	Complete