

# XTRA•GUARD® Flexible Cables

## PERMANENT SOLUTIONS FOR CRITICAL FLEXING APPLICATIONS

Manufactured In The U.S.A. 

Choose **XTRA•GUARD® Flexible Cables** to deliver high speed dependability along with the flexibility needed in cases of difficult and/or complex cable positioning. **XTRA•GUARD® Flexible Cables** feature unsurpassed flame and moisture resistance, outstanding oil and chemical resistance, premium grade PVC and Polyurethane jackets. **XTRA•GUARD® Flexible Cables** are UL Recognized or Listed, CSA certified, tested to MIL-C-13777G for flex life and are **CE** marked. Product performance is verified with certified test reports. Call or visit our web site at [www.alphawire.com](http://www.alphawire.com) for up-to-date cable test information.



### COMMON FLEXING APPLICATIONS

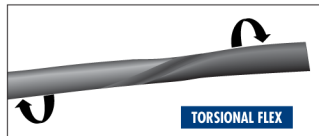
There are four common types of cable flexing movements to consider when designing and applying a high-flex cable. They are rolling flex, bending flex or "tic-toc", torsional flex and variable/random motion flex (see illustrations at right).

Different cable construction methods and materials are used depending on the cable flexing movement. For example: torsional cables will have a different lay length and cabling method than a rolling flex cable. Cable performance is evaluated using physical test data and statistical analysis to produce flex life and overall system reliability.

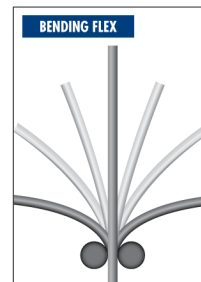
An understanding of the cables' application will allow the designer to choose the correct cable and reliably predict the products' lifetime and performance.



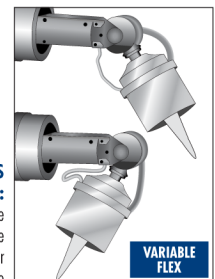
**For ROLLING FLEX APPLICATIONS SPECIFY AND CHOOSE:**  
**XTRA•GUARD® High-Flex Control Cable**  
**XTRA•GUARD® High-Flex Mini Diameter Data Cable**



**For TORSIONAL FLEX APPLICATIONS SPECIFY AND CHOOSE:**  
**XTRA•GUARD® High-Flex Torsion Robotic Cable**



**For BENDING FLEX APPLICATIONS SPECIFY AND CHOOSE:**  
**XTRA•GUARD® Standard-Flex Control Cable**  
**XTRA•GUARD® High-Flex Control Cable**  
**XTRA•GUARD® High-Flex Mini Diameter Data Cable**



**For VARIABLE FLEX APPLICATIONS SPECIFY AND CHOOSE:**  
**XTRA•GUARD® Standard-Flex Control Cable**  
**XTRA•GUARD® High-Flex Control Cable**  
**XTRA•GUARD® High-Flex Mini Diameter Data Cable**

### APPLICATIONS

- Applications Requiring Increased Flexibility
- Machine Tools
- CNC Machine Centers
- Data Processing Equipment
- Automation Equipment
- Material Handling Equipment
- Applications Requiring Continuous Flexing
- Robotics
- Installation in Cable Track
- Assembly Lines
- Industrial Electronic Processing Equipment
- DataComm Connections
- Connecting Sensors & Actuators to Controllers
- Sensor & I/O Interconnects
- Automation Networking
- PLC, Microprocessor & Computer Interconnects
- Twisting & Random Robotic Flexing Applications
- Power Supply to Welding, Painting & Articulating Robots

# XTRA·GUARD® Flexible Cables

## HIGH-FLEX MINI DIAMETER DATA CABLE

CONTINUOUS FLEXING, OIL RESISTANT, MULTICONDUCTOR, SHIELDED

UL AWM STYLE 2661  
CSA AWM II A/B FT4  
UL TYPE CM, CSA TYPE CMG  
RoHS COMPLIANT  
300 VOLT

### CHOOSE XTRA·GUARD HIGH-FLEX MINI DIAMETER MULTICONDUCTOR DATA CABLES FOR:

- Extreme Flexibility in Small Spaces
- Continual Flexing in Cable Tracks
- UL Listed, UL Recognized, CSA Certified and CE Marked
- Outstanding EMI Protection
- Superior Oil Resistance

### XTRA·GUARD HIGH-FLEX MINI DIAMETER MULTICONDUCTOR DATA CABLE APPLICATIONS:

- Industrial Electronic Processing Equipment
- DataComm Connections
- Connecting Sensors and Actuators to Controllers
- Sensor and I/O Interconnects

### CHARACTERISTICS

#### OPERATING TEMPERATURE:

- 5°C to 105°C (Flexing)
- -10°C to 105°C (Stationary)

#### VOLTAGE RATING:

- 300 Volt

#### COLOR DESCRIPTION:

- Color Code: See Chart D Page 375
- Jacket Color: Gray

#### PRODUCT DESCRIPTION:

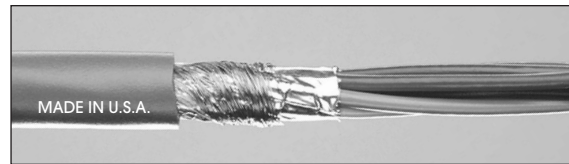
- Conductor: Super Finely Stranded Tinned Copper
- Insulation: Lubricated Semi-Rigid PVC
- Drain Wire: 26 AWG, 7/34 Stranded Tinned Copper
- Shielding: Foil and 90% Tinned Copper Serve
- Jacket: Oil Resistant PVC

### SPECIFICATIONS

- Bend Radius: 8X Cable Diameter, Min.
- UL Type CM
- UL AWM 2661
- CSA AWM II A/B FT4
- CSA CMG
- VDE 0472, Section 803 Oil Test (Jacket)
- CE LVD-CD 73/23/EEC Modified by CD 93/68/EEC
- RoHS Compliant



Canadian Standards Association



**28 AWG** (0,09mm<sup>2</sup>), **7/36** (7/0,13mm), Insulation Thickness: **0.010"** (0,25mm)

| Alpha Part No. | No. of Cond. | Jacket Thickness |     | Nominal Diameter |      |
|----------------|--------------|------------------|-----|------------------|------|
|                |              | Inches           | mm  | Inches           | mm   |
| 86002CY        | 2            | 0.040            | 1,0 | 0.185            | 4,70 |
| 86003CY        | 3            | 0.040            | 1,0 | 0.190            | 4,83 |
| 86004CY        | 4            | 0.040            | 1,0 | 0.200            | 5,08 |
| 86005CY        | 5            | 0.040            | 1,0 | 0.210            | 5,33 |
| 86007CY        | 7            | 0.040            | 1,0 | 0.225            | 5,72 |
| 86012CY        | 12           | 0.040            | 1,0 | 0.285            | 7,24 |
| 86018CY        | 18           | 0.040            | 1,0 | 0.290            | 7,37 |
| 86025CY        | 25           | 0.040            | 1,0 | 0.333            | 8,46 |

**26 AWG** (0,14mm<sup>2</sup>), **7/34** (7/0,16mm), Insulation Thickness: **0.010"** (0,25mm)

| Alpha Part No. | No. of Cond. | Jacket Thickness |     | Nominal Diameter |      |
|----------------|--------------|------------------|-----|------------------|------|
|                |              | Inches           | mm  | Inches           | mm   |
| 86102CY        | 2            | 0.040            | 1,0 | 0.190            | 4,83 |
| 86103CY        | 3            | 0.040            | 1,0 | 0.196            | 4,98 |
| 86104CY        | 4            | 0.040            | 1,0 | 0.206            | 5,23 |
| 86105CY        | 5            | 0.040            | 1,0 | 0.220            | 5,59 |
| 86107CY        | 7            | 0.040            | 1,0 | 0.240            | 6,10 |
| 86112CY        | 12           | 0.040            | 1,0 | 0.300            | 7,62 |
| 86118CY        | 18           | 0.040            | 1,0 | 0.307            | 7,80 |
| 86125CY        | 25           | 0.040            | 1,0 | 0.358            | 9,09 |

**24 AWG** (0,23mm<sup>2</sup>), **10/34** (10/0,16mm), Insulation Thickness: **0.010"** (0,25mm)

| Alpha Part No. | No. of Cond. | Jacket Thickness |     | Nominal Diameter |      |
|----------------|--------------|------------------|-----|------------------|------|
|                |              | Inches           | mm  | Inches           | mm   |
| 86202CY        | 2            | 0.040            | 1,0 | 0.200            | 5,08 |
| 86203CY        | 3            | 0.040            | 1,0 | 0.207            | 5,26 |
| 86204CY        | 4            | 0.040            | 1,0 | 0.218            | 5,54 |
| 86205CY        | 5            | 0.040            | 1,0 | 0.235            | 5,97 |
| 86207CY        | 7            | 0.040            | 1,0 | 0.260            | 6,60 |
| 86212CY        | 12           | 0.040            | 1,0 | 0.310            | 7,87 |
| 86218CY        | 18           | 0.040            | 1,0 | 0.330            | 8,38 |
| 86225CY        | 25           | 0.045            | 1,1 | 0.338            | 8,59 |

**22 AWG** (0,38mm<sup>2</sup>), **19/34** (19/0,16mm), Insulation Thickness: **0.010"** (0,25mm)

| Alpha Part No. | No. of Cond. | Jacket Thickness |     | Nominal Diameter |       |
|----------------|--------------|------------------|-----|------------------|-------|
|                |              | Inches           | mm  | Inches           | mm    |
| 86302CY        | 2            | 0.040            | 1,0 | 0.214            | 5,44  |
| 86303CY        | 3            | 0.040            | 1,0 | 0.222            | 5,64  |
| 86304CY        | 4            | 0.040            | 1,0 | 0.235            | 5,97  |
| 86305CY        | 5            | 0.040            | 1,0 | 0.249            | 6,32  |
| 86307CY        | 7            | 0.040            | 1,0 | 0.284            | 7,21  |
| 86312CY        | 12           | 0.040            | 1,0 | 0.354            | 8,99  |
| 86318CY        | 18           | 0.040            | 1,0 | 0.371            | 9,42  |
| 86325CY        | 25           | 0.045            | 1,1 | 0.424            | 10,77 |

### AVAILABILITY

- In Stock: Bulk, Cut to Length

### FIT® TUBING RECOMMENDATION

**FIT® FLEX** – Highly Flexible, Irradiated Silicone Rubber (See Page 134 for Product Specifications)

**FIT®-650** – Chemical and Temperature Resistant Irradiated Viton® (See Page 132 for Product Specifications)

Viton® is a registered trademark of DuPont Dow Elastomers



# TECHNICAL DATA

## COLOR CODE CHARTS

### MULTICONDUCTOR CABLES

375

**CHART D**

| No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe | No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe | No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe |
|-----|------------|------------|------------|------------|-----|------------|------------|------------|------------|-----|------------|------------|------------|------------|
| 1   | Black      |            |            |            | 35  | White      | Red        | Red        |            | 69  | White      | Black      | Green      | Blue       |
| 2   | Red        |            |            |            | 36  | White      | Red        | Green      |            | 70  | White      | Black      | Green      | Brown      |
| 3   | White      |            |            |            | 37  | White      | Red        | Blue       |            | 71  | White      | Black      | Green      | Orange     |
| 4   | Green      |            |            |            | 38  | White      | Red        | Brown      |            | 72  | White      | Black      | Green      | Gray       |
| 5   | Orange     |            |            |            | 39  | White      | Red        | Violet     |            | 73  | White      | Black      | Green      | Violet     |
| 6   | Blue       |            |            |            | 40  | White      | Green      | Black      |            | 74  | White      | Black      | Yellow     | Blue       |
| 7   | Brown      |            |            |            | 41  | White      | Green      | Red        |            | 75  | White      | Black      | Yellow     | Brown      |
| 8   | Yellow     |            |            |            | 42  | White      | Green      | Green      |            | 76  | White      | Black      | Yellow     | Orange     |
| 9   | Violet     |            |            |            | 43  | White      | Green      | Blue       |            | 77  | White      | Black      | Yellow     | Gray       |
| 10  | Gray       |            |            |            | 44  | White      | Green      | Brown      |            | 78  | White      | Black      | Yellow     | Violet     |
| 11  | Pink       |            |            |            | 45  | White      | Green      | Violet     |            | 79  | White      | Black      | Blue       | Brown      |
| 12  | Tan        |            |            |            | 46  | White      | Blue       | Black      |            | 80  | White      | Black      | Blue       | Orange     |
| 13  | Red        | Green      |            |            | 47  | White      | Blue       | Red        |            | 81  | White      | Black      | Blue       | Gray       |
| 14  | Red        | Yellow     |            |            | 48  | White      | Blue       | Green      |            | 82  | White      | Black      | Blue       | Violet     |
| 15  | Red        | Black      |            |            | 49  | White      | Blue       | Blue       |            | 83  | White      | Black      | Brown      | Orange     |
| 16  | White      | Black      |            |            | 50  | White      | Blue       | Brown      |            | 84  | White      | Black      | Brown      | Gray       |
| 17  | White      | Red        |            |            | 51  | White      | Blue       | Violet     |            | 85  | White      | Black      | Brown      | Violet     |
| 18  | White      | Green      |            |            | 52  | White      | Brown      | Black      |            | 86  | White      | Black      | Orange     | Gray       |
| 19  | White      | Yellow     |            |            | 53  | White      | Brown      | Red        |            | 87  | White      | Black      | Orange     | Violet     |
| 20  | White      | Blue       |            |            | 54  | White      | Brown      | Green      |            | 88  | White      | Black      | Gray       | Violet     |
| 21  | White      | Brown      |            |            | 55  | White      | Brown      | Blue       |            | 89  | White      | Red        | Black      | Green      |
| 22  | White      | Orange     |            |            | 56  | White      | Brown      | Brown      |            | 90  | White      | Red        | Black      | Yellow     |
| 23  | White      | Gray       |            |            | 57  | White      | Brown      | Violet     |            | 91  | White      | Red        | Black      | Blue       |
| 24  | White      | Violet     |            |            | 58  | White      | Violet     | Red        |            | 92  | White      | Red        | Black      | Brown      |
| 25  | White      | Black      | Red        |            | 59  | White      | Violet     | Green      |            | 93  | White      | Red        | Black      | Orange     |
| 26  | White      | Black      | Green      |            | 60  | White      | Violet     | Blue       |            | 94  | White      | Red        | Black      | Gray       |
| 27  | White      | Black      | Yellow     |            | 61  | White      | Black      | Red        | Green      | 95  | White      | Red        | Black      | Violet     |
| 28  | White      | Black      | Blue       |            | 62  | White      | Black      | Red        | Yellow     | 96  | White      | Red        | Green      | Yellow     |
| 29  | White      | Black      | Brown      |            | 63  | White      | Black      | Red        | Blue       | 97  | White      | Red        | Green      | Blue       |
| 30  | White      | Black      | Orange     |            | 64  | White      | Black      | Red        | Brown      | 98  | White      | Red        | Green      | Brown      |
| 31  | White      | Black      | Gray       |            | 65  | White      | Black      | Red        | Orange     | 99  | White      | Red        | Green      | Orange     |
| 32  | White      | Black      | Violet     |            | 66  | White      | Black      | Red        | Gray       | 100 | White      | Red        | Green      | Gray       |
| 33  | White      | Black      | Black      |            | 67  | White      | Black      | Red        | Violet     |     |            |            |            |            |
| 34  | White      | Red        | Black      |            | 68  | White      | Black      | Green      | Yellow     |     |            |            |            |            |

**CHART E**

| No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe | No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe | No. | Base Color | 1st Stripe | 2nd Stripe | 3rd Stripe |
|-----|------------|------------|------------|------------|-----|------------|------------|------------|------------|-----|------------|------------|------------|------------|
| 1   | Black      |            |            |            | 35  | White      | Red        | Orange     |            | 69  | White      | Black      | Orange     | Green      |
| 2   | Brown      |            |            |            | 36  | White      | Red        | Yellow     |            | 70  | White      | Black      | Orange     | Blue       |
| 3   | Red        |            |            |            | 37  | White      | Red        | Green      |            | 71  | White      | Black      | Orange     | Violet     |
| 4   | Orange     |            |            |            | 38  | White      | Red        | Blue       |            | 72  | White      | Black      | Orange     | Gray       |
| 5   | Yellow     |            |            |            | 39  | White      | Red        | Violet     |            | 73  | White      | Black      | Yellow     | Green      |
| 6   | Green      |            |            |            | 40  | White      | Red        | Gray       |            | 74  | White      | Black      | Yellow     | Blue       |
| 7   | Blue       |            |            |            | 41  | White      | Orange     | Yellow     |            | 75  | White      | Black      | Yellow     | Violet     |
| 8   | Violet     |            |            |            | 42  | White      | Orange     | Green      |            | 76  | White      | Black      | Yellow     | Gray       |
| 9   | Gray       |            |            |            | 43  | White      | Orange     | Blue       |            | 77  | White      | Black      | Green      | Blue       |
| 10  | White      |            |            |            | 44  | White      | Orange     | Violet     |            | 78  | White      | Black      | Green      | Violet     |
| 11  | White      | Black      |            |            | 45  | White      | Orange     | Gray       |            | 79  | White      | Black      | Green      | Gray       |
| 12  | White      | Brown      |            |            | 46  | White      | Yellow     | Green      |            | 80  | White      | Black      | Blue       | Violet     |
| 13  | White      | Red        |            |            | 47  | White      | Yellow     | Blue       |            | 81  | White      | Black      | Blue       | Gray       |
| 14  | White      | Orange     |            |            | 48  | White      | Yellow     | Violet     |            | 82  | White      | Black      | Violet     | Gray       |
| 15  | White      | Yellow     |            |            | 49  | White      | Yellow     | Gray       |            | 83  | White      | Brown      | Red        | Orange     |
| 16  | White      | Green      |            |            | 50  | White      | Green      | Blue       |            | 84  | White      | Brown      | Red        | Yellow     |
| 17  | White      | Blue       |            |            | 51  | White      | Green      | Violet     |            | 85  | White      | Brown      | Red        | Green      |
| 18  | White      | Violet     |            |            | 52  | White      | Green      | Gray       |            | 86  | White      | Brown      | Red        | Blue       |
| 19  | White      | Gray       |            |            | 53  | White      | Blue       | Violet     |            | 87  | White      | Brown      | Red        | Violet     |
| 20  | White      | Black      | Brown      |            | 54  | White      | Blue       | Gray       |            | 88  | White      | Brown      | Red        | Gray       |
| 21  | White      | Black      | Red        |            | 55  | White      | Violet     | Gray       |            | 89  | White      | Brown      | Orange     | Yellow     |
| 22  | White      | Black      | Orange     |            | 56  | White      | Black      | Brown      | Red        | 90  | White      | Brown      | Orange     | Green      |
| 23  | White      | Black      | Yellow     |            | 57  | White      | Black      | Brown      | Orange     | 91  | White      | Brown      | Orange     | Blue       |
| 24  | White      | Black      | Green      |            | 58  | White      | Black      | Brown      | Yellow     | 92  | White      | Brown      | Orange     | Violet     |
| 25  | White      | Black      | Blue       |            | 59  | White      | Black      | Brown      | Green      | 93  | White      | Brown      | Orange     | Gray       |
| 26  | White      | Black      | Violet     |            | 60  | White      | Black      | Brown      | Blue       | 94  | White      | Brown      | Yellow     | Green      |
| 27  | White      | Black      | Gray       |            | 61  | White      | Black      | Brown      | Violet     | 95  | White      | Brown      | Yellow     | Blue       |
| 28  | White      | Brown      | Red        |            | 62  | White      | Black      | Brown      | Gray       | 96  | White      | Brown      | Yellow     | Violet     |
| 29  | White      | Brown      | Orange     |            | 63  | White      | Black      | Red        | Yellow     | 97  | White      | Brown      | Yellow     | Gray       |
| 30  | White      | Brown      | Yellow     |            | 64  | White      | Black      | Red        | Green      | 98  | White      | Brown      | Green      | Blue       |
| 31  | White      | Brown      | Green      |            | 65  | White      | Black      | Red        | Blue       | 99  | White      | Brown      | Green      | Violet     |
| 32  | White      | Brown      | Blue       |            | 66  | White      | Black      | Red        | Violet     | 100 | White      | Brown      | Green      | Gray       |
| 33  | White      | Brown      | Violet     |            | 67  | White      | Black      | Red        | Gray       |     |            |            |            |            |
| 34  | White      | Brown      | Gray       |            | 68  | White      | Black      | Orange     | Yellow     |     |            |            |            |            |