

# UTiFLEX<sup>®</sup>

FLEXIBLE MICROWAVE CABLE ASSEMBLIES



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# UTiFLEX® in Action

Thermal vacuum testing is a risk-mitigation strategy utilized in some hi-rel applications, notably space equipment such as satellites. Our TVAC Test Assemblies are thermal vacuum compatible for use in TVAC chambers. These assemblies utilize high-performance, Ultra-Low-Loss UTiFLEX® Cable, and are produced to exacting space-grade standards utilizing low-outgassing materials and vented connectors.



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Microwave Cable for Almost Any Application

- » Versatile low-loss cables offer outstanding performance in almost any environment.
- » Low-loss cables have the lowest insertion loss available to 18, 26.5, 40, 50, 65 GHz.
- » Miniature cables are a superior alternative to traditional RG or semi-rigid cables.
- » Ultra-light cables provide up to 25% weight savings for spaceflight applications.

Key Features

- » Low SWR (1.25:1 to 40 GHz typical)
- » Excellent shielding effectiveness
- » Precision phase matching
- » ARACON® outer shield for superior weight savings on semi-rigid cables
- » Ultra-light cables

Space Qualified

- » J-STD-001 Space Addendum certified assemblers & inspectors
- » Class 10,000 clean-room assembly processes
- » Low-outgassing materials (1% TML, 0.1% CVCM per ASTM E-595)
- » Radiation-resistant up to 100 Mrads
- » Real-time X-ray capability

Available Variants

- » Miniature
- » Low-Loss
- » Ultra-Low-Loss
- » MKR Ruggedized
- » External Armor
- » Ultra-Light
- » TVAC

Bends to Your Application.  
Stands Up to Everything Else.

UTIFLEX® microwave cable assemblies are constructed using a low or ultra-low-density PTFE dielectric coupled with fully shielded outer conductors and a unique connector attachment that withstands mechanical and thermal stresses far better than standard connectors. The result: Excellent loss characteristics, outstanding phase stability, and superb flexibility compared to standard flexible cables — all without sacrificing mechanical integrity.

Manufactured in our Pottstown, PA, location, under the expert guidance of our professional engineering team, every UTIFLEX® cable assembly is tested for insertion loss and SWR, and shipped with an individual test certificate.



Center Conductor

**Solid or stranded silver-plated copper wire per ASTM B-298 or silver-plated copper clad steel wire per ASTM B-501.** In comparison to equal-sized center conductors, the solid center conductor has less RF resistance and lower attenuation, and is more amplitude-stable with flexure. The stranded center conductor is more flexible and more phase-stable with flexure.

Dielectric

**Low-density PTFE per MIL-DTL-17, with a dielectric constant ranging from 1.4 to 1.7 depending on the cable type.** Most transmission losses are caused either directly or indirectly by the dielectric. In addition, the dielectric determines the velocity of propagation, temperature range, power rating, and phase and amplitude stability, and contributes to cable flexibility. The UTIFLEX® PTFE dielectric is ideal for these critical parameters due to its low density and low thermal coefficient of expansion.

Inner Shield

**Silver-plated copper tape per ASTM B-298, helically wrapped with 40% minimum overlap between layers.** This shield allows for outstanding flexibility while providing 100% coverage. By closely monitoring the precision wrapping process and carefully matching the elasticity of the dielectric to the properties of the silver-plated copper tape, uniform impedance and ideal contact between individual layers of the shield are maintained.

Outer Shield

**Silver-plated copper wire per ASTM B-298, tightly braided over the inner shield.** The braids are primarily a strength member that also add additional RF shielding. For applications such as spaceflight, where weight is critical, we offer ARACON® as the braiding material.

Jacket

**Fluorinated Ethylene Propylene (FEP), colored light aqua blue.** The FEP is excellent because of its high-temperature resistance and chemical inertness. Other jacket materials are available such as DuPont™ Tefzel® and carbon-loaded Tefzel® for spaceflight applications.

DuPont™ and Tefzel® are trademarks or registered trademarks of E.I. duPont de Nemours and Company.

Cable Selection Guide

In order to simplify the cable selection process, individual cables have been grouped into product families. Most flexible cable users want minimal insertion loss consistent with the smallest size and weight, without sacrificing flexibility. Other parameters will influence price and performance. Use the tables and information below to select the cable that best suits your needs.

- » Cables with stranded center conductors tend to be more phase-stable with flexure.

» Cables with solid center conductors tend to be more amplitude-stable with flexure.

» For applications less than 26.5 GHz, start with the low-loss UFA210A cable.

» If the cable will be used in a test lab environment, consider MKR300C for applications less than 26.5 GHz.
- » If lower insertion loss is required, ultra-low-loss UFB205A or UFB197C should be chosen. If the application is less than 18 GHz, choose the ultra-low-loss UFB311A or UFB293C.

» If size & flexibility are critical, consider the low-loss UFA147B or ultra-low-loss UFB142C cables.

| MINIATURE LOW-LOSS                         |          | UGF070D       | UFF092D      | UFF092F      |
|--------------------------------------------|----------|---------------|--------------|--------------|
| Impedance                                  |          | 50 Ω          | 50 Ω         | 50 Ω         |
| Max. Frequency                             |          | 18 GHz        | 18 GHz       | 18 GHz       |
| Max. Insertion Loss<br><i>db/ft (dB/M)</i> | @ 1 GHz  | 0.29 (0.95)   | 0.20 (0.66)  | 0.22 (0.72)  |
|                                            | @ 10 GHz | 1.01 (3.31)   | 0.66 (2.17)  | 0.71 (2.33)  |
|                                            | @ 18 GHz | 1.41 (4.63)   | 0.90 (2.95)  | 0.98 (3.22)  |
| Power Handling <i>Watts (CW)</i>           | @ 10 GHz | 36            | 63           | 60           |
| Nom. Outer Diameter <i>in (mm)</i>         |          | 0.070 (1.78)  | 0.092 (2.34) | 0.092 (2.34) |
| Max. Weight <i>g/ft (g/m)</i>              |          | 3 (9.8)       | 5.0 (16.4)   | 5.0 (16.4)   |
| Center Conductor Type                      |          | Solid         | Solid        | Stranded     |
| Static Bend Radius <i>in (mm)</i>          |          | 0.10 (2.54)   | 0.13 (3.30)  | 0.25 (6.35)  |
| Detailed Information                       |          | Pages 10 - 11 |              |              |

| LOW-LOSS                                   |            | UFC092D      | UFA125A         | UFA147A      | UFA147B      | UFA210A      | UFA210B      |
|--------------------------------------------|------------|--------------|-----------------|--------------|--------------|--------------|--------------|
| Impedance                                  |            | 50 Ω         | 50 Ω            | 50 Ω         | 50 Ω         | 50 Ω         | 50 Ω         |
| Max. Frequency                             |            | 65 GHz       | 50 GHz          | 40 GHz       | 40 GHz       | 26.5 GHz     | 26.5 GHz     |
| Max. Insertion Loss<br><i>db/ft (dB/M)</i> | @ 1 GHz    | 0.20 (0.66)  | 0.14 (0.46)     | 0.11 (0.36)  | 0.16 (0.52)  | 0.08 (0.26)  | 0.09 (0.30)  |
|                                            | @ 10 GHz   | 0.67 (2.20)  | 0.48 (1.57)     | 0.39 (1.28)  | 0.52 (1.71)  | 0.27 (0.89)  | 0.30 (0.98)  |
|                                            | @ 18 GHz   | 0.92 (3.02)  | 0.66 (2.17)     | 0.54 (1.77)  | 0.72 (2.36)  | 0.38 (1.25)  | 0.42 (1.38)  |
|                                            | @ 26.5 GHz | 1.13 (3.71)  | 0.82 (2.69)     | 0.67 (2.20)  | 0.89 (2.92)  | 0.48 (1.57)  | 0.53 (1.74)  |
|                                            | @ 40 GHz   | 1.42 (4.66)  | 1.04 (3.41)     | 0.85 (2.79)  | 1.12 (3.67)  | -            | -            |
|                                            | @ 50 GHz   | 1.61 (5.28)  | 1.19 (3.90)     | -            | -            | -            | -            |
|                                            | @ 65 GHz   | 1.86 (6.10)  | -               | -            | -            | -            | -            |
| Power Handling <i>Watts (CW)</i>           | @ 10 GHz   | 63           | 112             | 159          | 149          | 303          | 283          |
| Nom. Outer Diameter <i>in (mm)</i>         |            | 0.092 (2.34) | 0.125 (3.18 mm) | 0.147 (3.73) | 0.147 (3.73) | 0.210 (5.33) | 0.210 (5.33) |
| Max. Weight <i>g/ft (g/m)</i>              |            | 5.0 (16.4)   | 8.8 (28.9)      | 12.1 (39.7)  | 12.1 (39.7)  | 22 (72.2)    | 22 (72.2)    |
| Center Conductor Type                      |            | Solid        | Solid           | Solid        | Solid        | Solid        | Stranded     |
| Static Bend Radius <i>in (mm)</i>          |            | 0.13 (3.30)  | 0.20" (5.08)    | 0.25 (6.35)  | 0.25 (6.35)  | 0.38 (9.65)  | 0.38 (9.65)  |
| Detailed Information                       |            | page 12-13   |                 |              |              |              |              |

| MKR TEST CABLE                             |            | MKR300C      |
|--------------------------------------------|------------|--------------|
| Impedance                                  |            | 50 Ω         |
| Max. Frequency                             |            | 26.5 GHz     |
| Max. Insertion Loss<br><i>db/ft (dB/M)</i> | @ 1 GHz    | 0.08 (0.26)  |
|                                            | @ 10 GHz   | 0.27 (0.89)  |
|                                            | @ 18 GHz   | 0.36 (1.18)  |
|                                            | @ 26.5 GHz | 0.44 (1.44)  |
|                                            | @ 40 GHz   | -            |
| Power Handling <i>Watts (CW)</i>           | @ 10 GHz   | 175          |
| Nom. Outer Diameter <i>in (mm)</i>         |            | 0.300 (7.62) |
| Max. Weight <i>g/ft (g/m)</i>              |            | 51 (167.3)   |
| Center Conductor                           |            | Stranded     |
| Static Bend Radius <i>in (mm)</i>          |            | 1.50 (38.10) |
| Detailed Information                       |            | page 18-19   |



| ULTRA-LOW-LOSS                             | UFB088D    | UFB142C       | UFB142A      | UFC185A      | UFB197C       | UFB205A      | UFB293C      | UFB311A      |
|--------------------------------------------|------------|---------------|--------------|--------------|---------------|--------------|--------------|--------------|
| Impedance                                  | 50 Ω       | 50 Ω          | 50 Ω         | 50 Ω         | 50 Ω          | 50 Ω         | 50 Ω         | 50 Ω         |
| Max. Frequency                             | 18 GHz     | 40 GHz        | 40 GHz       | 32 GHz       | 26.5 GHz      | 26.5 GHz     | 18 GHz       | 18 GHz       |
| Max. Insertion Loss<br><i>db/ft (dB/M)</i> | @ 1 GHz    | 0.20 (0.66)   | 0.11 (0.36)  | 0.10 (0.33)  | 0.08 (0.26)   | 0.09 (0.28)  | 0.07 (0.23)  | 0.06 (0.20)  |
|                                            | @ 10 GHz   | 0.66 (2.17)   | 0.36 (1.18)  | 0.33 (1.08)  | 0.27 (0.89)   | 0.28 (0.93)  | 0.23 (0.75)  | 0.18 (0.59)  |
|                                            | @ 18 GHz   | 0.89 (2.92)   | 0.49 (1.61)  | 0.44 (1.44)  | 0.36 (1.18)   | 0.38 (1.26)  | 0.32 (1.05)  | 0.25 (0.82)  |
|                                            | @ 26.5 GHz | -             | 0.59 (1.94)  | 0.54 (1.77)  | 0.44 (1.44)   | 0.47 (1.55)  | 0.39 (1.28)  | -            |
|                                            | @ 32 GHz   | -             | 0.66 (2.16)  | 0.60 (1.97)  | 0.49 (1.61)   | -            | -            | -            |
| Power Handling <i>Watts (CW)</i>           | @ 40 GHz   | -             | 0.74 (2.43)  | 0.68 (2.23)  | -             | -            | -            | -            |
|                                            | @ 10 GHz   | 66            | 166          | 175          | 267           | 296          | 326          | 570          |
| Nom. Outer Diameter <i>in (mm)</i>         |            | 0.088 (2.235) | 0.142 (3.61) | 0.142 (3.61) | 0.185 (4.699) | 0.197 (5.00) | 0.205 (5.21) | 0.293 (7.44) |
| Max. Weight <i>g/ft (g/m)</i>              |            | 4.2 (13.78)   | 9.9 (32.5)   | 10.1 (33.1)  | 17.6 (57.74)  | 19.8 (65.0)  | 20 (65.6)    | 42 (137.8)   |
| Center Conductor                           |            | Solid         | Stranded     | Solid        | Solid         | Stranded     | Solid        | Stranded     |
| Static Bend Radius <i>in (mm)</i>          |            | 0.25 (6.35)   | 0.38 (9.65)  | 0.38 (9.65)  | 0.375 (9.525) | 0.50 (12.70) | 0.50 (12.70) | 0.75 (19.05) |
| Detailed Information                       |            | page 14-15    |              |              |               |              |              |              |

| ULTRA-LIGHT*                               | MCJ088D    | MCJ142A      | MCJ185A      | MCJ205A      | MCJ311A      |
|--------------------------------------------|------------|--------------|--------------|--------------|--------------|
| Impedance                                  | 50 Ω       | 50 Ω         | 50 Ω         | 50 Ω         | 50 Ω         |
| Max. Frequency                             | 18 GHz     | 40 GHz       | 32 GHz       | 26.5 GHz     | 18 GHz       |
| Max. Insertion Loss<br><i>db/ft (dB/M)</i> | @ 1 GHz    | 0.20 (0.66)  | 0.10 (0.33)  | 0.08 (0.26)  | 0.07 (0.23)  |
|                                            | @ 10 GHz   | 0.66 (2.17)  | 0.33 (1.08)  | 0.27 (0.89)  | 0.23 (0.75)  |
|                                            | @ 18 GHz   | 0.89 (2.92)  | 0.44 (1.44)  | 0.36 (1.18)  | 0.32 (1.05)  |
|                                            | @ 26.5 GHz | -            | 0.54 (1.77)  | 0.44 (1.44)  | 0.39 (1.28)  |
|                                            | @ 32 GHz   | -            | 0.60 (1.97)  | 0.49 (1.61)  | -            |
|                                            | @ 40 GHz   | -            | 0.68 (2.23)  | -            | -            |
| Power Handling <i>Watts (CW)</i>           | @ 10 GHz   | 64           | 173          | 267          | 326          |
| Nom. Outer Diameter <i>in (mm)</i>         |            | 0.088 (2.24) | 0.142 (3.61) | 0.185 (4.70) | 0.205 (5.21) |
| Max. Weight <i>g/ft (g/m)</i>              |            | 3.6 (11.8)   | 8.8 (28.9)   | 12.4 (40.7)  | 16.0 (52.5)  |
| Center Conductor                           |            | Solid        | Solid        | Solid        | Solid        |
| Static Bend Radius <i>in (mm)</i>          |            | 0.25 (6.35)  | 0.38 (9.65)  | 0.38 (9.65)  | 0.50 (12.70) |
| Detailed Information                       |            | page 16-17   |              |              |              |

\*Ultra-Light cables are also available with an aluminum center conductor, which offers an additional weight savings of up to 10% depending on cable type.

Connector Selection Guide

We specialize in custom, high-performance connectors that cannot be obtained from conventional sources. Please contact us to discuss your unique and demanding connector requirements.

Design and materials of all connectors and connector parts conform to MIL-PRF-39012. The UTiFLEX® connectors have been optimized to achieve the lowest possible SWR across the bandwidth. In addition, the unique connector attachment has been designed to provide high reliability and withstand heavy stress. The connector body, dielectric, and center contact are completely captivated, guaranteeing the cable assembly will keep its excellent properties even after hard use.

| Description           | Part Number     | Cable Group*               | Rated Frequency | Maximum SWR (per connector)           |
|-----------------------|-----------------|----------------------------|-----------------|---------------------------------------|
| 2.4 mm Plug           | 100             | 04, 05                     | 40 / 50 GHz     | 1.16:1 – 18 GHz<br>1.22:1 – 40/50 GHz |
| 2.4 mm Jack           | 110             | 04, 05                     | 40 / 50 GHz     | 1.16:1 – 18 GHz<br>1.22:1 – 40/50 GHz |
| SMK Plug              | 200 (20V Space) | 05, 09                     | 32/40 GHz       | 1.16:1 – 18 GHz<br>1.20:1 – 40 GHz    |
| SMK Right-Angle Plug  | 280 (2QV Space) | 05, 09                     | 32/40 GHz       | 1.16:1 – 18 GHz<br>1.20:1 – 40 GHz    |
| SMK Jack              | 210             | 05                         | 40 GHz          | 1.16:1 – 18 GHz<br>1.20:1 – 40 GHz    |
| Precision 3.5 mm Plug | 000             | 05, 07                     | 26.5 GHz        | 1.16:1 – 18 GHz<br>1.20:1 – 26.5 GHz  |
| Precision 3.5 mm Jack | 010             | 05, 07                     | 26.5 GHz        | 1.16:1 – 18 GHz                       |
| SMA Plug              | 300 (30V Space) | 01, 02, 05, 06, 07, 08, 09 | 18 GHz          | 1.16:1 – 18 GHz                       |
| SMA Jack              | 310 (31V Space) | 01, 02, 05, 06, 07, 08     | 18 GHz          | 1.16:1 – 18 GHz                       |
| SMA Right Angle Plug  | 380 (3QV Space) | 02, 05, 06, 07, 08         | 18 GHz          | 1.20:1 – 18 GHz                       |
| SMA Bulkhead Jack     | 320 (32V Space) | 02, 05, 06, 07             | 18 GHz          | 1.16:1 – 18 GHz                       |
| Precision 7 mm        | 460             | 05, 06, 07, 08             | 18 GHz          | 1.16:1 – 18 GHz                       |
| Precision N Plug 50U  | 50U             | 05, 06, 07, 08             | 18 GHz          | 1.16:1 – 18 GHz                       |
| Precision N Jack      | 510             | 05, 06, 07, 08             | 18 GHz          | 1.16:1 – 18 GHz                       |
| Precision TNC Plug    | 60u (A0V Space) | 05, 06, 07, 08             | 18 GHz          | 1.20:1 – 18 GHz                       |
| Precision TNC Jack    | 610 (A1R Space) | 05, 06, 07, 08             | 18 GHz          | 1.20:1 – 18 GHz                       |
| N Plug 70U            | 70U             | 07, 08                     | 12.4 GHz        | 1.16:1 – 12.4 GHz                     |
| N Jack                | 710             | 07, 08                     | 12.4 GHz        | 1.16:1 – 12.4 GHz                     |
| BNC Plug              | 804             | 07                         | 4 GHz           | 1.20:1 – 4 GHz                        |
| SMP Jack              | F10             | 01, 02, 04                 | 18 GHz          | 1.16:1 – 18 GHz                       |
| SMP Right Angle Jack  | F80             | 01, 02, 04                 | 18 GHz          | 1.20:1 – 18 GHz                       |

| *Cable Groups                               | Number |
|---------------------------------------------|--------|
| UGF070D                                     | 01     |
| UFF092D, UFF092F, MCJ088D, UFB088D, UFC092D | 02     |
| UFA125A                                     | 04     |
| UFA147A, UFB142A, MCJ142A                   | 05     |
| UFA147B, UFB142C                            | 06     |
| UFA210A, UFA210B, UFB205A, UFB197C, MCJ205A | 07     |
| UFB311A, UFB293C, MCJ311A                   | 08     |
| MCJ185A, UFC185A                            | 09     |

Most connector types are also available in a right-angle elbow configuration. Additional connector types (not listed) are available upon request. Please contact us for outline drawings or any special requirements.

Armor Selection Guide

Most UTiFLEX® Cable Assemblies are available with armor. The armor extends the assembly life and adds additional physical protection. Two standard armors are detailed below. Additional armor types are available. Please contact us with any special requirements.

| -1 POLYURETHANE JACKET OVERBRAID/STAINLESS STEEL SPIRAL |             |              |              |
|---------------------------------------------------------|-------------|--------------|--------------|
| Cable Groups (see page 8)                               | 04, 05, 06  | 07           | 08           |
| Diameter in (mm)                                        | 0.35 (8.89) | 0.41 (10.41) | 0.53 (13.46) |
| Min. Bend Radius in (mm)                                | 0.5 (12.70) | 1.0 (25.40)  | 1.5 (38.10)  |
| Max. Temperature                                        | 80 °C       | 80 °C        | 80 °C        |
| Crush Resistance lbs/in (N/mm)                          | 450 (79.4)  | 450 (79.4)   | 450 (79.4)   |

- Features
- » Very flexible
  - » Waterproof & UV-resistant
  - » Good abrasion & cut-through resistance
  - » Torque resistant & adds pull strength

- Typical Application
- » Test lab or antenna range



| -2 STAINLESS STEEL INTERLOCKED HOSE |             |             |              |
|-------------------------------------|-------------|-------------|--------------|
| Cable Groups (see page 8)           | 04, 05, 06  | 07          | 08           |
| Diameter in (mm)                    | 0.28 (7.11) | 0.38 (9.65) | 0.49 (12.45) |
| Min. Bend Radius in (mm)            | 1.5 (38.10) | 2.0 (50.80) | 2.0 (50.80)  |
| Max. Temperature                    | 165 °C      | 165 °C      | 165 °C       |
| Crush Resistance lbs/in (N/mm)      | 420 (74.1)  | 420 (74.1)  | 420 (74.1)   |

- Features
- » Suitable for higher temperature environments
  - » Prevents over-bending
  - » Excellent abrasion & cut-through resistance
  - » Cost-effective

- Typical Application
- » Military hardware



# UTiFLEX® Miniature Low-Loss Cable Assemblies

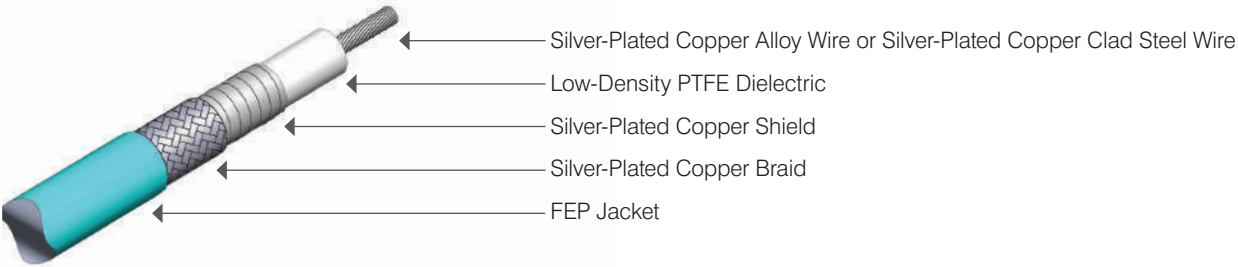
These general purpose microwave miniature cables have been designed to offer superior electrical performance in the smallest possible package for fixed installations. They are a cost-effective alternative when an RG cable cannot perform to your system needs, or when a semi-rigid cable is too cumbersome. The UTiFLEX® miniature cables are available with a large selection of connectors, and can be easily customized to meet your exact requirements.

| Mechanical Characteristics              |          | UGF070D                                       | UFF092D          | UFF092F          |
|-----------------------------------------|----------|-----------------------------------------------|------------------|------------------|
| Outer Diameter <i>in (mm)</i>           |          | 0.070 (1.78)                                  | 0.092 (2.34)     | 0.092 (2.34)     |
| Center Conductor Type                   |          | Solid                                         | Solid            | Stranded         |
| Max. Weight <i>g/ft (g/m)</i>           |          | 3 (9.8)                                       | 5 (16.4)         | 5 (16.4)         |
| Min. Bend Radius <i>in (mm)</i>         |          | 0.10 (2.54)                                   | 0.13 (3.30)      | 0.25 (6.35)      |
| Cable Flex Life                         |          | 100,000 *                                     | 25,000 *         | 170,000 *        |
| Electrical Characteristics              |          | UGF070D                                       | UFF092D          | UFF092F          |
| Impedance                               |          | 50 Ω                                          | 50 Ω             | 50 Ω             |
| Frequency Range                         |          | DC to 18 GHz                                  | DC to 18 GHz     | DC to 18 GHz     |
| Velocity of Propagation                 |          | 87%                                           | 77%              | 77%              |
| Capacitance <i>pF/ft (pF/m)</i>         |          | 26.2 (86)                                     | 26.2 (86)        | 26.2 (86)        |
| Shielding Effectiveness                 | @ 1 GHz  | > 100 dB                                      | > 100 dB         | > 100 dB         |
|                                         | @ 10 GHz | 0.29 (0.92)                                   | 0.20 (0.66)      | 0.22 (0.72)      |
| Max. Insertion Loss <i>db/ft (dB/M)</i> | @ 10 GHz | 1.01 (3.31)                                   | 0.67 (2.20)      | 0.71 (2.33)      |
|                                         | @ 18 GHz | 1.41 (4.63)                                   | 0.92 (3.02)      | 0.98 (3.22)      |
|                                         |          | See figure on next page                       |                  |                  |
| Phase Stability vs. Flexure             | @ 10 GHz | 2° †                                          | 2° ‡             | 2° ‡             |
|                                         | @ 18 GHz | 3° †                                          | 3° ‡             | 3° ‡             |
| Phase Stability vs. Temp.               |          | See figure on next page                       |                  |                  |
| Power Handling                          |          | See figure on next page                       |                  |                  |
| VSWR                                    |          | See figure on next page                       |                  |                  |
| Environmental Characteristics           |          | UGF070D                                       | UFF092D          | UFF092F          |
| Temperature Range                       |          | -65 °C to 165 °C                              | -65 °C to 165 °C | -65 °C to 165 °C |
|                                         |          | See Page 22 for applicable environmental test |                  |                  |

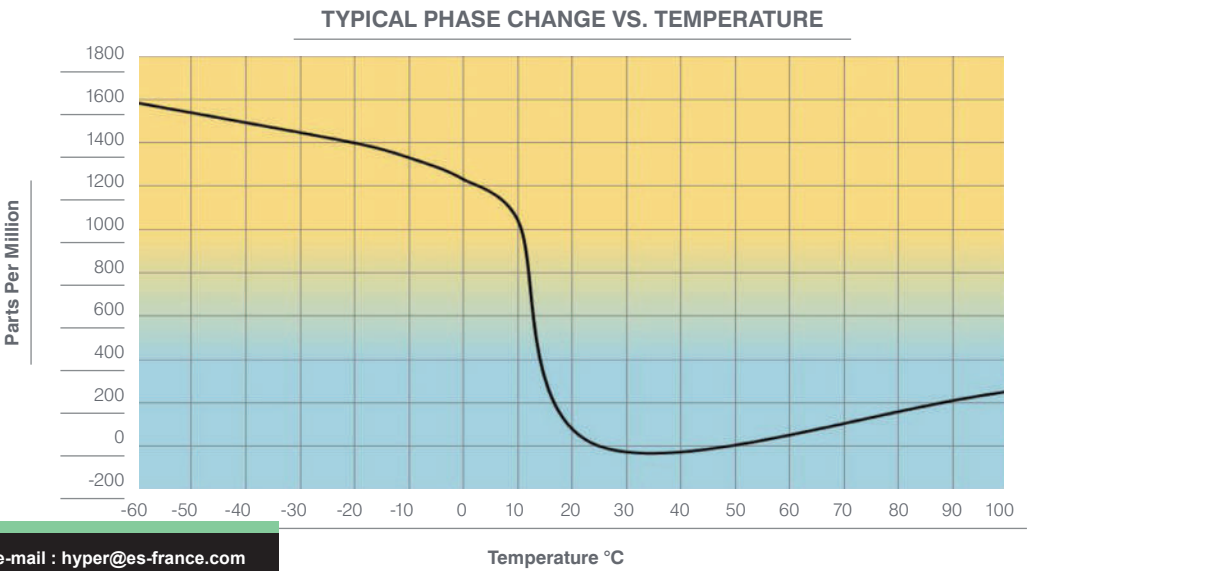
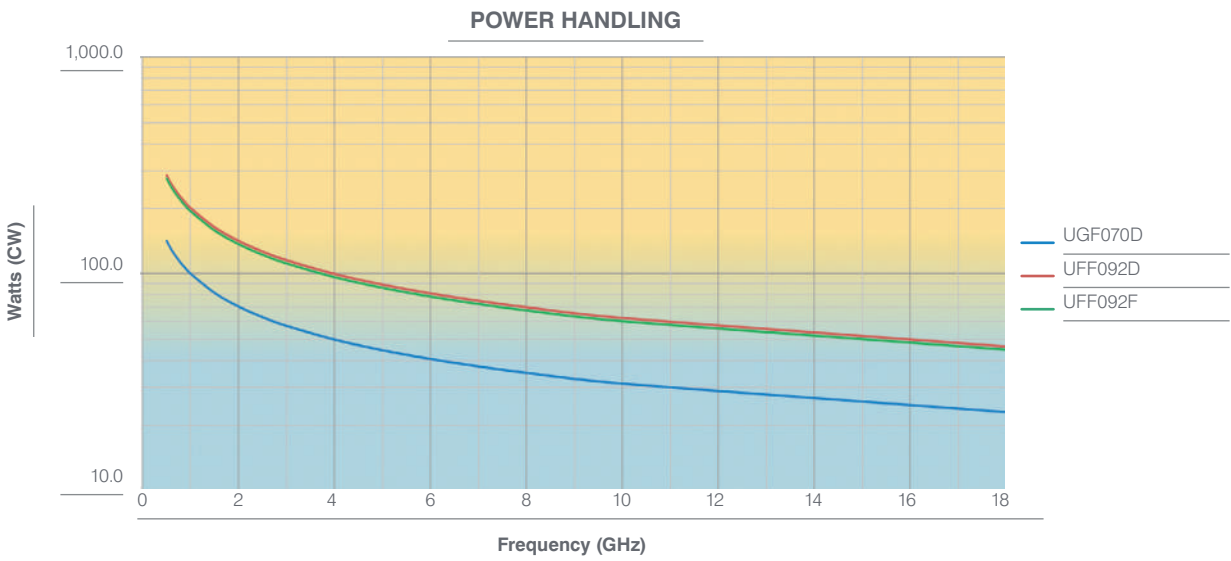
\* Cable shall withstand specified number of unrestrained flexures (snake test)

† Cable wrapped once around a 1.5 in diameter mandrel

‡ Cable wrapped once around a 3 in mandrel



## Performance



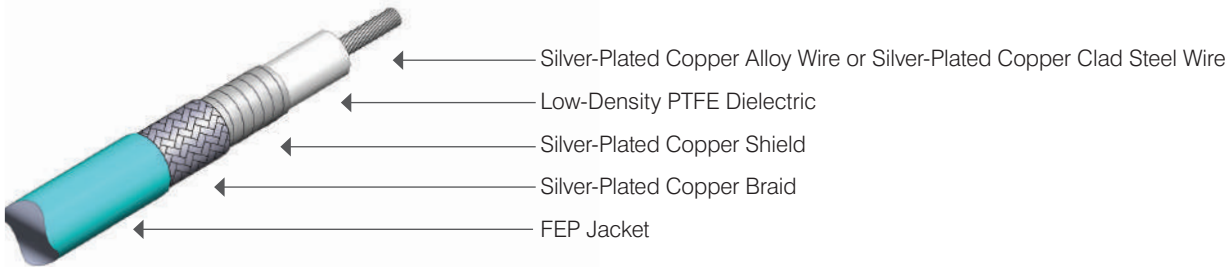
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UTiFLEX® Low-Loss Cable Assemblies

UTiFLEX® Low-Loss Cable Assemblies provide you with the complete high-performance microwave cable. They have outstanding mechanical integrity without sacrificing insertion loss, phase stability, or SWR. UTiFLEX® Low-Loss Cable Assemblies are extremely versatile and moderately priced, and fit a large variety of applications.

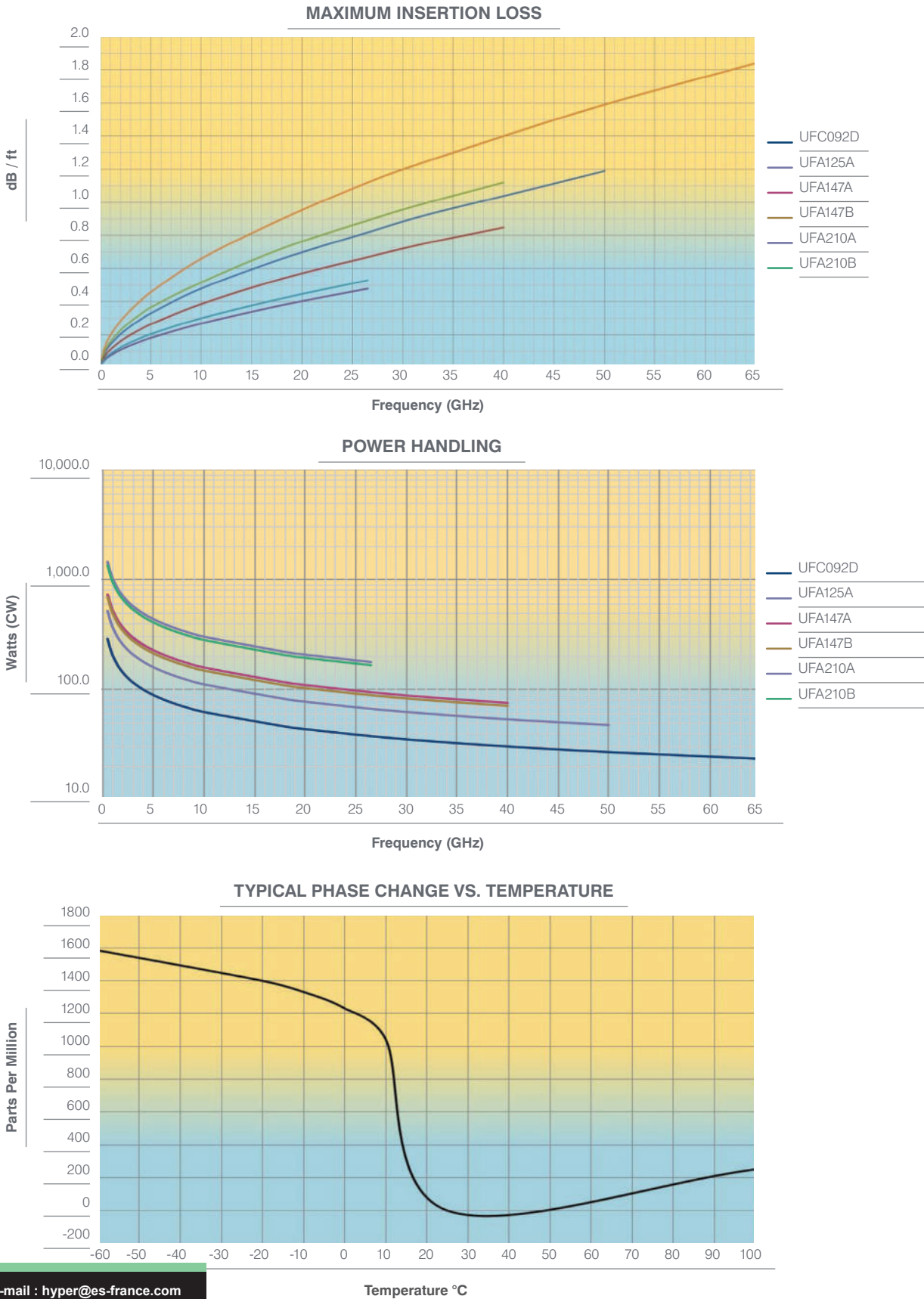
| Mechanical Characteristics              |            | UFC092D                                       | UFA125A          | UFA147A          | UFA147B          | UFA210A          | UFA210B          |
|-----------------------------------------|------------|-----------------------------------------------|------------------|------------------|------------------|------------------|------------------|
| Outer Diameter <i>in (mm)</i>           |            | 0.092 (2.34)                                  | 0.125 (3.18)     | 0.147 (3.73)     | 0.147 (3.73)     | 0.210 (5.33)     | 0.210 (5.33)     |
| Center Conductor Type                   |            | Solid                                         | Solid            | Solid            | Stranded         | Solid            | Stranded         |
| Max. Weight <i>g/ft (g/m)</i>           |            | 5 (16.4)                                      | 8.8 (28.9)       | 12.1 (39.7)      | 12.1 (39.7)      | 22 (72.2)        | 22 (72.2)        |
| Min. Bend Radius <i>in (mm)</i>         |            | 0.13 (3.30)                                   | 0.20 (5.08)      | 0.25 (6.35)      | 0.25 (6.35)      | 0.38 (9.65)      | 0.38 (9.65)      |
| Cable Flex Life                         |            | -                                             | 3,000 *          | 10,000 *         | 100,000 *        | 100,000 *        | 250,000 *        |
| Electrical Characteristics              |            | UFC092D                                       | UFA125A          | UFA147A          | UFA147B          | UFA210A          | UFA210B          |
| Impedance                               |            | 50 Ω                                          | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             |
| Frequency Range                         |            | DC to 65 GHz                                  | DC to 50 GHz     | DC to 40 GHz     | DC to 40 GHz     | DC to 26.5 GHz   | DC to 26.5 GHz   |
| Velocity of Propagation                 |            | 78%                                           | 77%              | 77%              | 77%              | 77%              | 77%              |
| Capacitance <i>pF/ft (pF/m)</i>         |            | 26.2 (87.9)                                   | 26.2 (86)        | 26.2 (86)        | 26.2 (86)        | 26.2 (86)        | 26.2 (86)        |
| Shielding Effectiveness                 |            | @ 1 GHz > 100 dB                              | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         |
| Max. Insertion Loss <i>db/ft (dB/M)</i> | @ 1 GHz    | 0.20 (0.66)                                   | 0.14 (0.46)      | 0.11 (0.36)      | 0.16 (0.52)      | 0.08 (0.25)      | 0.09 (0.30)      |
|                                         | @ 10 GHz   | 0.67 (2.20)                                   | 0.48 (1.57)      | 0.39 (1.28)      | 0.52 (1.71)      | 0.27 (0.89)      | 0.30 (0.98)      |
|                                         | @ 18 GHz   | 0.92 (3.02)                                   | 0.66 (2.17)      | 0.54 (1.77)      | 0.72 (2.36)      | 0.38 (1.25)      | 0.42 (1.38)      |
|                                         | @ 26.5 GHz | 1.13 (3.71)                                   | 0.82 (2.64)      | 0.67 (2.20)      | 0.89 (2.92)      | 0.48 (1.57)      | 0.53 (1.74)      |
|                                         | @ 40 GHz   | 1.42 (4.66)                                   | 1.04 (3.41)      | 0.85 (2.79)      | 1.12 (3.67)      | 1.12 (3.67)      | -                |
|                                         | @ 50 GHz   | 1.61 (5.28)                                   | 1.19 (3.90)      | -                | -                | -                | -                |
|                                         | @ 65 GHz   | 1.86 (6.10)                                   | -                | -                | -                | -                | -                |
| Phase Stability vs. Flexure             |            | @ 10 GHz <0.5°                                | 3° †             | 2° †             | 1° †             | 2° †             | 2° †             |
|                                         |            | @ 18 GHz <0.5°                                | 5° †             | 4° †             | 2° †             | 4° †             | 3° †             |
| Phase Stability vs. Temp.               |            | See figure on next page                       |                  |                  |                  |                  |                  |
| Power Handling                          |            | See figure on next page                       |                  |                  |                  |                  |                  |
| VSWR                                    |            | See connector selection guide                 |                  |                  |                  |                  |                  |
| Environmental Characteristics           |            | UFC092D                                       | UFA125A          | UFA147A          | UFA147B          | UFA210A          | UFA210B          |
| Temperature Range                       |            | -65 °C to 165 °C                              | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C |
|                                         |            | See Page 22 for applicable environmental test |                  |                  |                  |                  |                  |

\* Cable shall withstand specified number of unrestrained flexures (snake test)  
† Cable wrapped once around a 3 in diameter mandrel



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Performance

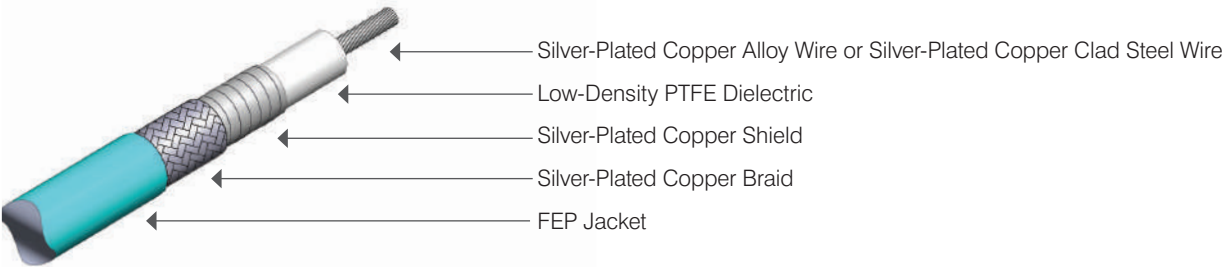


UTiFLEX® Ultra-Low-Loss Cable Assemblies

UTiFLEX® Ultra-Low-Loss Cable Assemblies are optimized to provide the lowest insertion loss available in a flexible cable construction up to 18, 26.5, and 40 GHz. The cables utilize an ultra-low-density PTFE dielectric that lowers weight and insertion loss, improves electrical stability, and provides greater resilience and flexibility when compared to standard microwave cables.

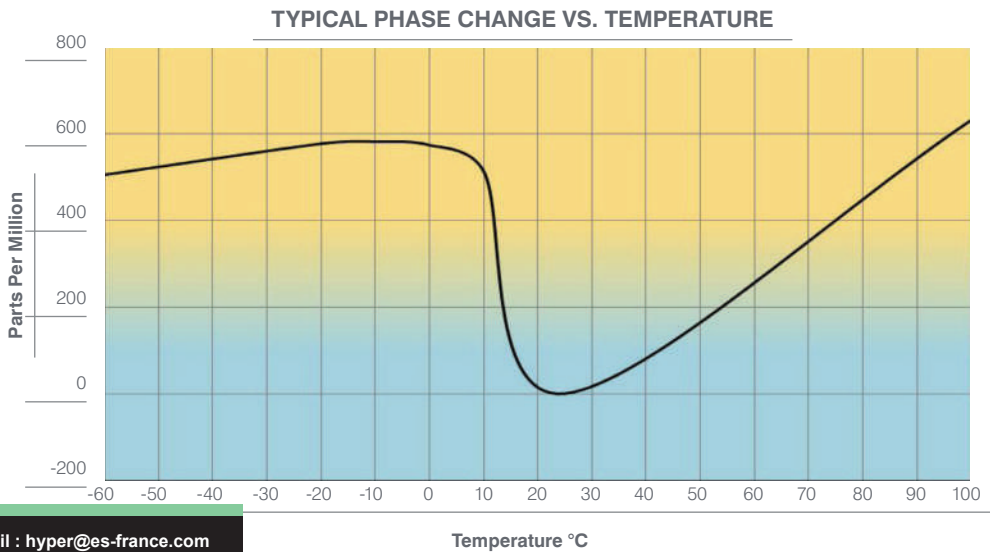
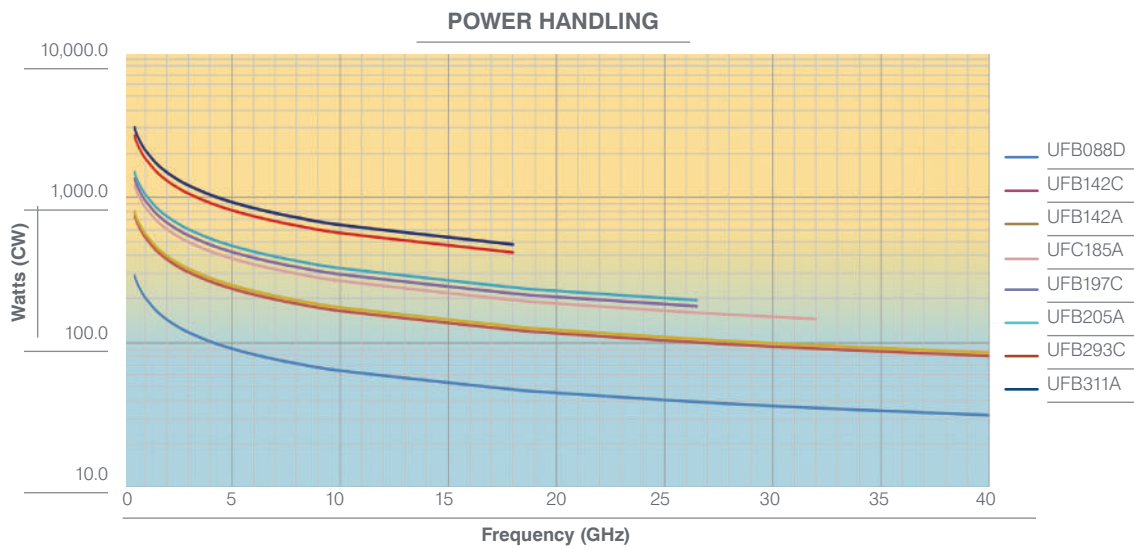
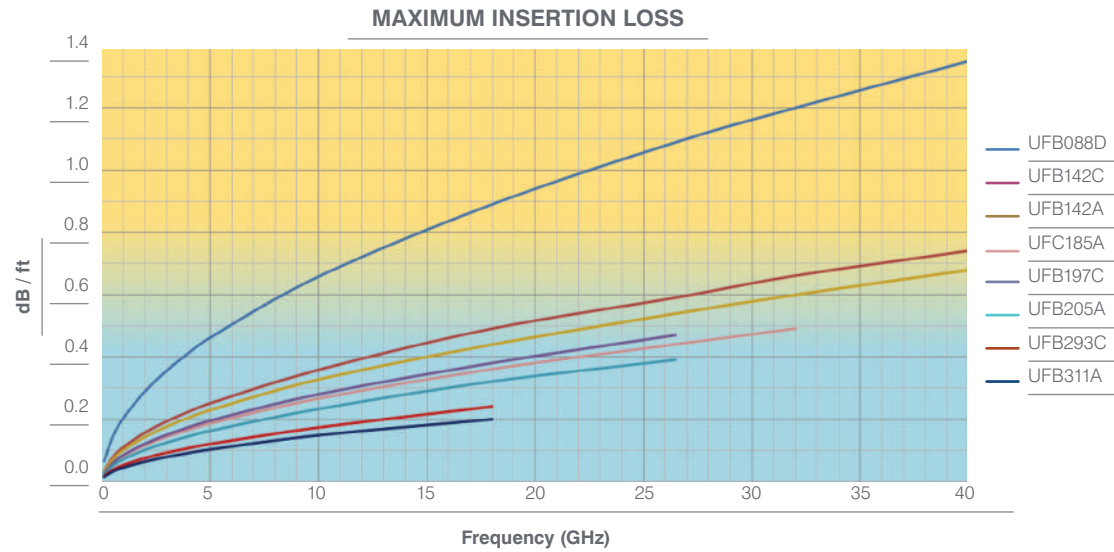
| Mechanical Characteristics       | UFB088D                       | UFB142C          | UFB142A          | UFC185A          | UFB197C          | UFB205A          | UFB293C          | UFB311A          |
|----------------------------------|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Outer Diameter in (mm)           | 0.088 (2.235)                 | 0.142 (3.61)     | 0.142 (3.61)     | 0.185 (4.699)    | 0.197 (5.00)     | 0.205 (5.21)     | 0.293 (7.44)     | 0.311 (7.90)     |
| Center Conductor Type            | Solid                         | Stranded         | Solid            | Solid            | Stranded         | Solid            | Stranded         | Solid            |
| Max. Weight g/ft (g/m)           | 4.2 (13.78)                   | 9.9 (32.5)       | 10.1 (33.1)      | 17.6 (57.74)     | 19.8 (65.0)      | 20.0 (65.6)      | 42 (137.8)       | 44.5 (146.0)     |
| Min. Bend Radius in (mm)         | 0.25 (6.35)                   | 0.38 (9.65)      | 0.38 (9.65)      | 0.375 (9.525)    | 0.50 (12.70)     | 0.50 (12.70)     | 0.75 (19.05)     | 1.25 (31.75)     |
| Cable Flex Life                  | 25,000 *                      | 75,000 *         | 75,000 *         | 10,000 *         | 150,000 *        | 25,000 *         | 50,000 *         | 15,000 *         |
| Electrical Characteristics       | UFB088D                       | UFB142C          | UFB142A          | UFC185A          | UFB197C          | UFB205A          | UFB293C          | UFB311A          |
| Impedance                        | 50 Ω                          | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             | 50 Ω             |
| Frequency Range                  | DC to 18 GHz                  | DC to 40 GHz     | DC to 40 GHz     | DC to 32 GHz     | DC to 26.5 GHz   | DC to 26.5 GHz   | DC to 18 GHz     | DC to 18 GHz     |
| Velocity of Propagation          | 80%                           | 83%              | 83%              | 83%              | 81%              | 83.5%            | 81.5%            | 84%              |
| Capacitance pF/ft (pF/m)         | 25.6 (84)                     | 24.5 (80.4)      | 25.1 (82.4)      | 25.3 (83.0)      | 24.8 (81.4)      | 24.8 (81.4)      | 24.5 (80.4)      | 24.2 (79.4)      |
| Shielding Effectiveness          | @ 1 GHz > 100 dB              | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         | > 100 dB         |
| Max. Insertion Loss db/ft (dB/M) | @ 1 GHz                       | 0.20 (0.66)      | 0.11 (0.36)      | 0.10 (0.33)      | 0.08 (0.26)      | 0.09 (0.28)      | 0.07 (0.23)      | 0.06 (0.20)      |
|                                  | @ 10 GHz                      | 0.66 (2.17)      | 0.36 (1.18)      | 0.33 (1.08)      | 0.27 (0.89)      | 0.28 (0.93)      | 0.23 (0.75)      | 0.18 (0.59)      |
|                                  | @ 18 GHz                      | 0.89 (2.92)      | 0.49 (1.61)      | 0.44 (1.44)      | 0.36 (1.18)      | 0.38 (1.26)      | 0.32 (1.05)      | 0.25 (0.82)      |
|                                  | @ 26.5 GHz                    | -                | 0.59 (1.94)      | 0.54 (1.77)      | 0.44 (1.44)      | 0.47 (1.55)      | 0.39 (1.28)      | -                |
|                                  | @ 32 GHz                      | -                | 0.66 (2.16)      | 0.60 (1.97)      | 0.49 (1.61)      | -                | -                | -                |
| Phase Stability vs. Flexure      | @ 40 GHz                      | -                | 0.74 (2.43)      | 0.68 (2.23)      | -                | -                | -                | -                |
|                                  | @ 10 GHz                      | 2° †             | 3° †             | 2° †             | 3° †             | 2° †             | 4° †             | 2° †             |
| Phase Stability vs. Temp.        | @ 18 GHz                      | 3° †             | 5° †             | 5° †             | 6° †             | 3° †             | 7° †             | 3° †             |
|                                  | @ 18 GHz                      | 3° †             | 5° †             | 5° †             | 6° †             | 3° †             | 7° †             | 1° †             |
| Power Handling                   | See figure on next page       |                  |                  |                  |                  |                  |                  |                  |
| VSWR                             | See connector selection guide |                  |                  |                  |                  |                  |                  |                  |
| Environmental Characteristics    | UFB088D                       | UFB142C          | UFB142A          | UFC185A          | UFB197C          | UFB205A          | UFB293C          | UFB311A          |
| Temperature Range                | -65 °C to 165 °C              | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C | -65 °C to 165 °C |

\* Cable shall withstand specified number of unrestrained flexures (snake test)  
† Cable wrapped once around a 3 in diameter mandrel



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Performance

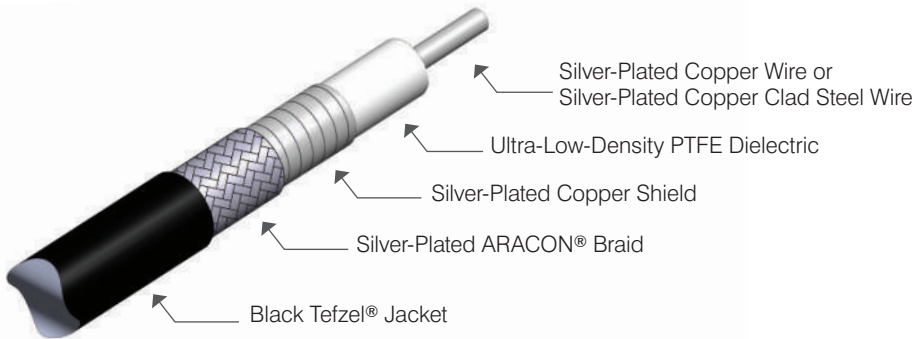


UTiFLEX® Ultra-Light Cable Assemblies

UTiFLEX® Ultra-Light Cable Assemblies are optimized for spaceflight applications. They provide the lightest weight, lowest insertion loss, and best radiation resistance in a flexible cable construction. The cables utilize our ARACON® for the outer shield, an ultra-low-density PTFE for the dielectric, and a DuPont Tefzel® jacket. If required, cable assemblies are manufactured in a Class 10,000 clean-room by certified solder technicians.

| Mechanical Characteristics       | MCJ088D                       | MCJ142A           | MCJ185A           | MCJ205A           | MCJ311A           |
|----------------------------------|-------------------------------|-------------------|-------------------|-------------------|-------------------|
| Outer Diameter in (mm)           | 0.088 (2.24)                  | 0.142 (3.61)      | 0.185 (4.70)      | 0.205 (5.21)      | 0.310 (7.87)      |
| Center Conductor Type            | Solid                         | Solid             | Solid             | Solid             | Solid             |
| Max. Weight g/ft (g/m)           | 3.6 (11.8)                    | 8.8 (28.9)        | 12.4 (40.7)       | 16.0 (52.5)       | 35 (114.8)        |
| Min. Bend Radius in (mm)         | 0.25 (6.35)                   | 0.38 (9.65)       | 0.38 (9.65)       | 0.50 (12.70)      | 1.25 (31.75)      |
| Electrical Characteristics       | MCJ088D                       | MCJ142A           | MCJ185A           | MCJ205A           | MCJ311A           |
| Impedance                        | 50 Ω                          | 50 Ω              | 50 Ω              | 50 Ω              | 50 Ω              |
| Frequency Range                  | DC to 18 GHz                  | DC to 40 GHz      | DC to 32 GHz      | DC to 26.5 GHz    | DC to 18 GHz      |
| Velocity of Propagation          | 80%                           | 83%               | 83%               | 84%               | 83%               |
| Capacitance pF/ft (pF/m)         | 25.5 (83.7)                   | 24.5 (80.4)       | 24.5 (80.4)       | 24.2 (79.4)       | 24.5 (80.4)       |
| Shielding Effectiveness          | @ 1 GHz > 100 dB              | > 100 dB          | > 100 dB          | > 100 dB          | > 100 dB          |
| Max. Insertion Loss db/ft (dB/M) | See figure on next page       |                   |                   |                   |                   |
|                                  | @ 1 GHz                       | 0.20 (0.66)       | 0.10 (0.33)       | 0.08 (0.26)       | 0.07 (0.23)       |
|                                  | @ 10 GHz                      | 0.66 (2.17)       | 0.33 (1.08)       | 0.27 (0.89)       | 0.23 (0.75)       |
|                                  | @ 18 GHz                      | 0.89 (2.92)       | 0.44 (1.44)       | 0.36 (1.18)       | 0.32 (1.05)       |
|                                  | @ 26.5 GHz                    | -                 | 0.54 (1.77)       | 0.44 (1.44)       | 0.39 (1.28)       |
|                                  | @ 32 GHz                      | -                 | 0.60 (1.97)       | 0.49 (1.61)       | -                 |
| Phase Stability vs. Flexure      | @ 10 GHz                      | 2° †              | 2° †              | 2° †              | 1° †              |
|                                  | @ 18 GHz                      | 2° †              | 3° †              | 6° †              | 2° †              |
| Phase Stability vs. Temp.        | See figure on next page       |                   |                   |                   |                   |
| Power Handling                   | See figure on next page       |                   |                   |                   |                   |
| VSWR                             | See connector selection guide |                   |                   |                   |                   |
| Environmental Characteristics    | MCJ088D                       | MCJ142A           | MCJ185A           | MCJ205A           | MCJ311A           |
| Temperature Range                | -150 °C to 165 °C             | -150 °C to 165 °C | -150 °C to 165 °C | -150 °C to 165 °C | -150 °C to 165 °C |

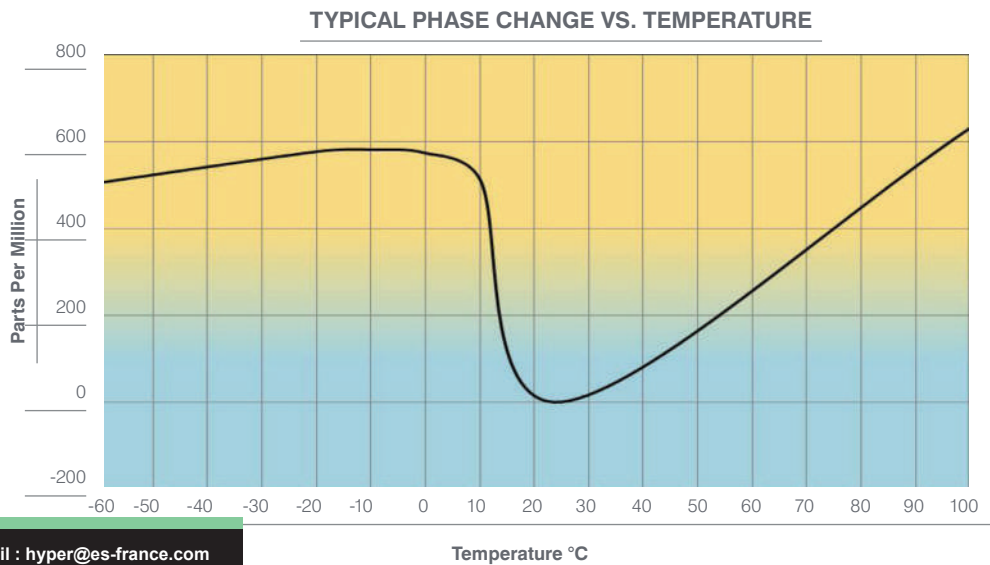
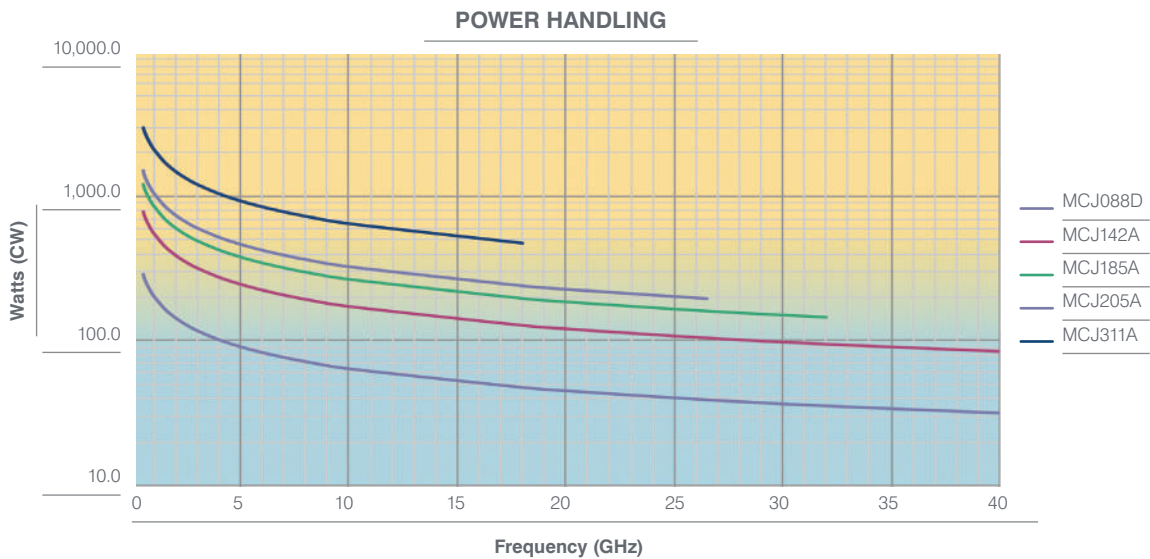
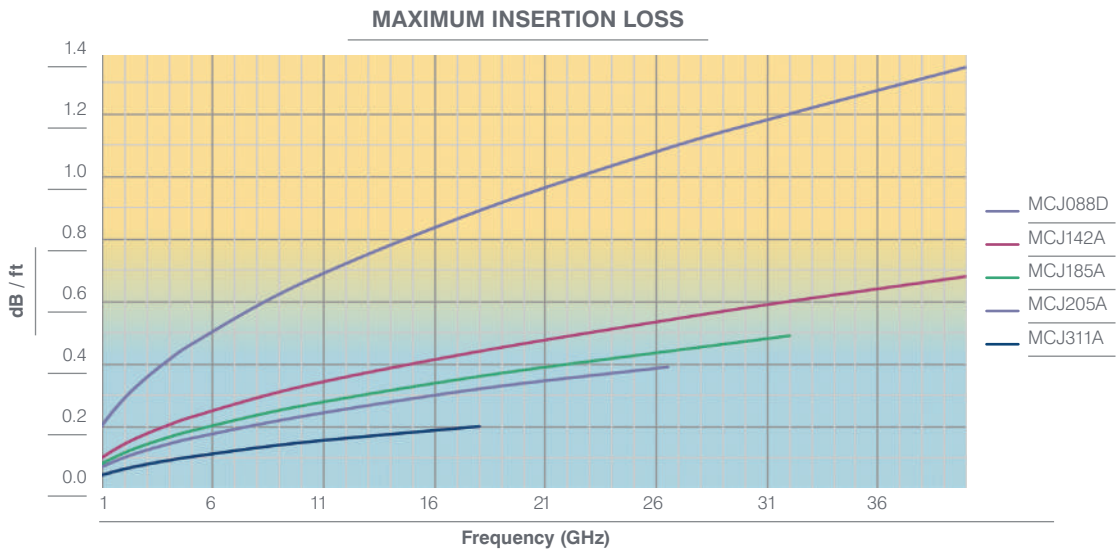
† Cable wrapped once around a 3 in diameter mandrel



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Performance



# UTiFLEX® MKR Test Cable Assemblies

Our MKR test cable assemblies represent the best in our technology. Using our industry-leading UTiFLEX® microwave cable as a base, we fit MKR with an additional highly flexible and abrasive-resistant ruggedization.

The resulting integrated product becomes an ideal choice for test labs or any testing environment requiring excellent mechanical strength and long-term reliability in a compact package. Our MKR test cable assemblies have passed strenuous lifetime qualification testing to ensure long-term reliability. Though extremely flexible, they also feature excellent crush, torque, and kink resistance, ideally suited to the demanding requirements of today’s test environments. MKR test cables are available in the 26.5-GHz MKR300C series which are capable of withstanding 150,000 unrestrained flexes with minimal degradation.

## MKR300C

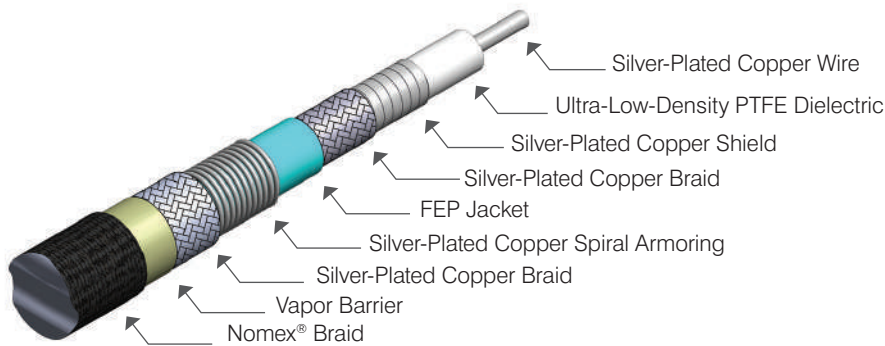
| Materials                      |                    |
|--------------------------------|--------------------|
| Center Conductor Material      | 7 Strand SPC Alloy |
| Dielectric Material            | ULD PTFE           |
| Inner Shield Material          | SPC                |
| Outer Shield Material          | SPC                |
| Jacket Material                | FEP                |
| Internal Armor                 | SPC                |
| Outer Armor                    | SPC BRAID          |
| Vapor Barrier                  | Proprietary        |
| Outer Abrasion Resistant Braid | NOMEX®             |

| Mechanical Characteristics      |              |
|---------------------------------|--------------|
| Outer Diameter <i>in (mm)</i>   | 0.300 (7.62) |
| Center Conductor Type           | Stranded     |
| Max. Weight <i>g/ft (g/m)</i>   | 51 (167.3)   |
| Min. Bend Radius <i>in (mm)</i> | 1.50 (38.10) |

| Environmental Characteristics |                  |
|-------------------------------|------------------|
| Temperature Range             | -65 °C to 165 °C |

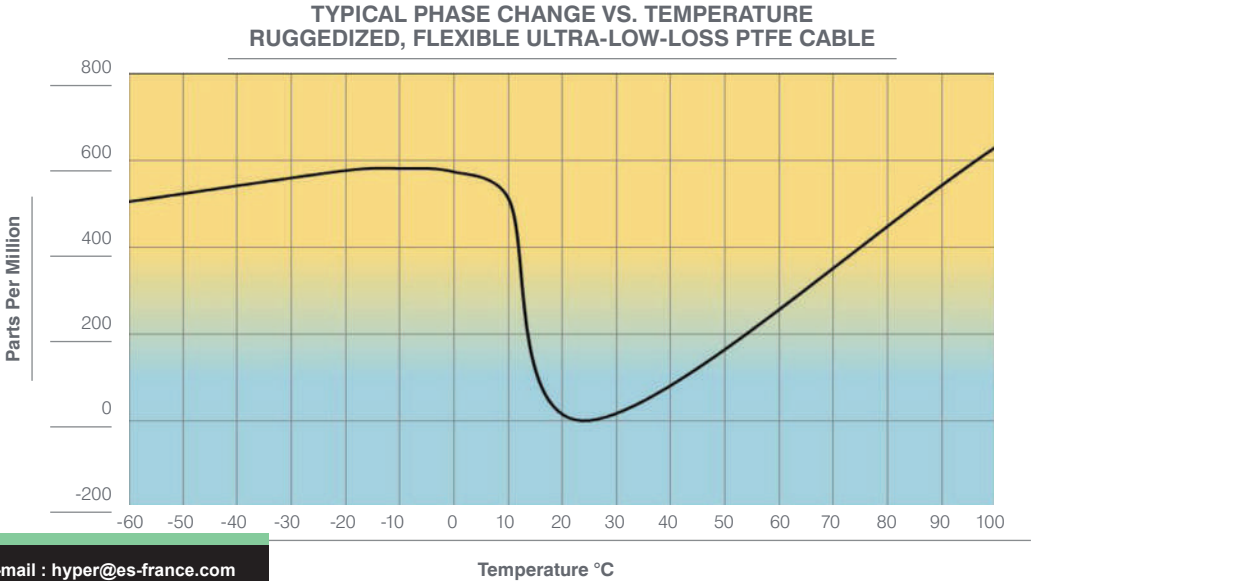
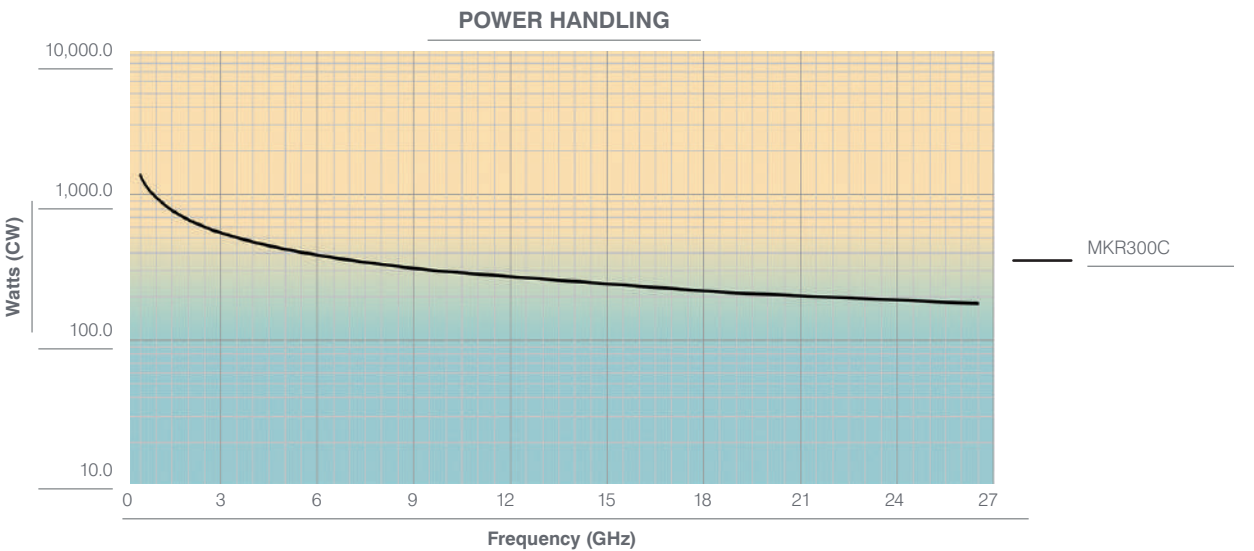
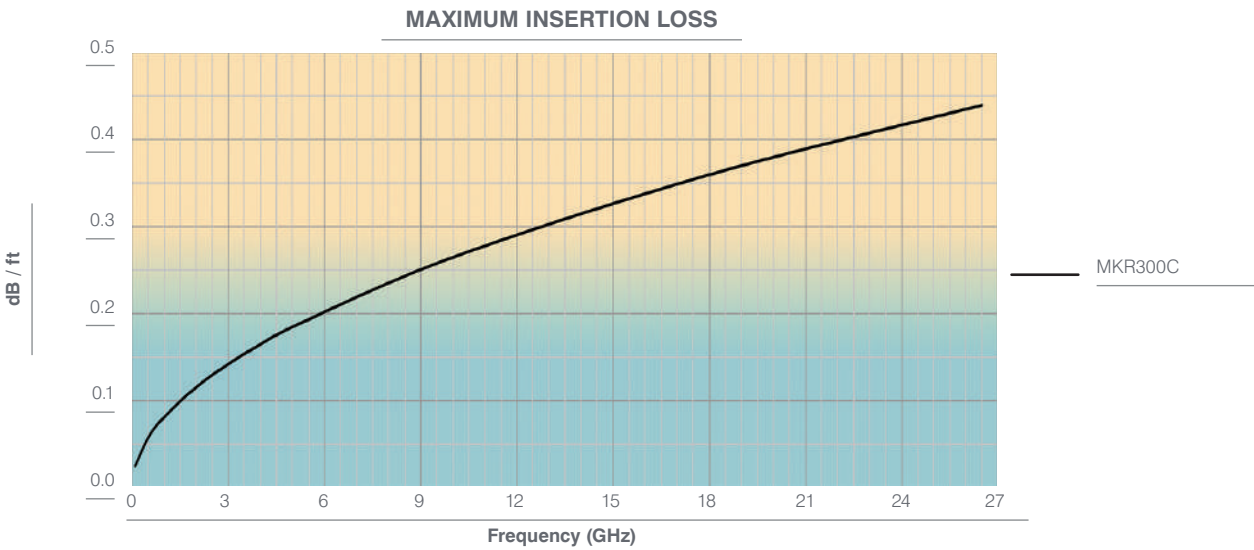
| Electrical Characteristics              |            |                |
|-----------------------------------------|------------|----------------|
| Impedance                               |            | 50 Ω           |
| Frequency Range                         |            | DC to 26.5 GHz |
| Velocity of Propagation                 |            | 81%            |
| Capacitance <i>pF/ft (pF/m)</i>         |            | 25.1 (82.4)    |
| Shielding Effectiveness                 | @ 1 GHz    | >100 dB        |
| Max. Insertion Loss <i>db/ft (dB/M)</i> | @ 1 GHz    | 0.08 (0.25)    |
|                                         | @ 10 GHz   | 0.27 (0.89)    |
|                                         | @ 18 GHz   | 0.36 (1.18)    |
|                                         | @ 26.5 GHz | 0.44 (1.44)    |
|                                         | @ 40 GHz   | -              |
| Phase Stability vs Flexure*             | @ 10 GHz   | 2°             |
|                                         | @ 18 GHz   | 3°             |

\* Cable wrapped once around a 3 in diameter mandrel



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## Performance



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# UTiFLEX® Thermal Vacuum Test Cable Assemblies

Thermal vacuum testing is a risk mitigation strategy utilized in some hi-rel applications, notably space equipment such as satellites. Our TVAC Test Assemblies are thermal vacuum compatible for use in TVAC chambers. These assemblies utilize high-performance, Ultra-Low-Loss UTiFLEX® Cable, and are produced to exacting space-grade standards utilizing low-outgassing materials and vented connectors.

## Key Characteristics

- » Low outgassing per ASTM E-595 (<1%TML and <0.1% CVCM) temperature range: -65 °C to 165 °C (Typical, consult factory for individual types)
  - » Ideal phase performance due to ultra-low-loss dielectric materials
  - » Superior cable mechanical stability & connector captivation techniques to address increasing thermal extremes of the space market
  - » Clean-room manufacturing & real-time X-ray upon request
- » High-power configurations available. All high-power TVAC Assemblies are manufactured in a clean-room environment to full space-grade standards. Consult us for specific power/frequency requirements
  - » Individually bagged to prevent post-assembly contamination
  - » Vented connectors



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| Mechanical Characteristics              |            | UFB142A      | UFC185A      | UFB197C      | UFB205A      | UFB293C      | UFB311A       |
|-----------------------------------------|------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Nom. Outer Diameter <i>in (mm)</i>      |            | 0.142 (3.61) | 0.185 (4.70) | 0.197 (5.00) | 0.205 (5.21) | 0.293 (7.44) | 0.311 (7.90)  |
| Center Conductor Type                   |            | Solid        | Solid        | Stranded     | Solid        | Stranded     | Solid         |
| Max Weight <i>g/ft (g/m)</i>            |            | 10.1 (33.1)  | 17.6 (57.7)  | 19.8 (65.0)  | 20 (65.6)    | 42 (137.8)   | 44.5 (146.0)  |
| Static Bend Radius <i>in (mm)</i>       |            | 0.38 (9.65)  | 0.38 (9.65)  | 0.50 (12.70) | 0.50 (12.70) | 0.75 (19.05) | 1.25 ( 31.75) |
| Electrical Characteristics              |            | UFB142A      | UFC185A      | UFB197C      | UFB205A      | UFB293C      | UFB311A       |
| Impedance                               |            | 50 Ω         | 50 Ω         | 50 Ω         | 50 Ω         | 50 Ω         | 50 Ω          |
| Max. Frequency                          |            | 40 GHz       | 32 GHz       | 26.5 GHz     | 26.5 GHz     | 18 GHz       | 18 GHz        |
| Max. Insertion Loss <i>db/ft (dB/M)</i> | @ 1 GHz    | 0.10 (0.33)  | 0.08 (0.26)  | 0.09 (0.28)  | 0.07 (0.23)  | 0.06 (0.20)  | 0.05 (0.16)   |
|                                         | @ 10 GHz   | 0.33 (1.08)  | 0.27 (0.89)  | 0.28 (0.93)  | 0.23 (0.75)  | 0.18 (0.59)  | 0.15 (0.49)   |
|                                         | @ 18 GHz   | 0.44 (1.44)  | 0.36 (1.18)  | 0.38 (1.26)  | 0.32 (1.05)  | 0.25 (0.82)  | 0.21 (0.69)   |
|                                         | @ 26.5 GHz | 0.54 (1.77)  | 0.44 (1.44)  | 0.47 (1.55)  | 0.39 (1.28)  | —            | —             |
|                                         | @ 32 GHz   | 0.60 (1.97)  | 0.49 (1.61)  | —            | —            | —            | —             |
|                                         | @ 40 GHz   | 0.68 (2.23)  | —            | —            | —            | —            | —             |
| Power Handling <i>Watts (CW)</i>        | @ 10 GHz   | 175          | 267          | 296          | 326          | 570          | 648           |

## Connector Options

| Description        | Connector P/N | TVAC CABLE P/Ns         | Frequency     | Max SWR (Per Connector)            |
|--------------------|---------------|-------------------------|---------------|------------------------------------|
| SMK PLUG           | 20V           | 142                     | DC – 40 GHz   | 1.16:1 – 18 GHz, 1.22:1 – 40 GHz   |
| SMK PLUG           | 20V           | 185                     | DC – 32 GHz   | 1.16:1 – 18 GHz, 1.22:1 – 32 GHz   |
| SMK PLUG           | 20V           | 205                     | DC – 26.5 GHz | 1.16:1 – 18 GHz, 1.20:1 – 26.5 GHz |
| PC3.5MM PLUG       | 00V           | 205                     | DC – 26.5 GHz | 1.16:1 – 18 GHz, 1.20:1 – 26.5 GHz |
| SMA PLUG           | 30V           | 142, 197, 205, 293, 311 | DC – 18 GHz   | 1.16:1 – 18 GHz                    |
| Precision N PLUG   | 50V           | 142, 197, 205, 293, 311 | DC – 18 GHz   | 1.16:1 – 18 GHz                    |
| Precision TNC PLUG | 60V           | 142, 197, 205, 293, 311 | DC – 18 GHz   | 1.20:1 – 18 GHz                    |

## Part Number Designation (Example)

| Base Part Number         |                                                                                                                                                                         | Phase Matching (Optional) |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| UFB142A-0-XXXX-20V20V TV |                                                                                                                                                                         | AM                        |
| Where                    | XXXX is cable assembly length in 0.1 inch increment.<br>Length Tolerance = -0 / +0.5 inches (XXXX <= 100 inches)<br>Length Tolerance = -0 / + 0.5% (XXXX >= 100 inches) |                           |
|                          | If absolute phase matching is required, then add “AM” code. For phase-matched assemblies, length tolerance is not applicable.                                           |                           |



# Environmental Characteristics

UTiFLEX® Cable Assemblies are designed to survive the harshest and most stringent environments, including:

- » Spaceflight
- » Airframe
- » Laboratory
- » Arctic/Desert
- » Battlefield

UTiFLEX® Cable Assemblies have tested successfully for numerous environmental requirements, some of which are listed below. After exposure to these conditions, the cable assembly did not show visible damage and the insertion loss, SWR, and connector interface dimensions remained within specified limits.

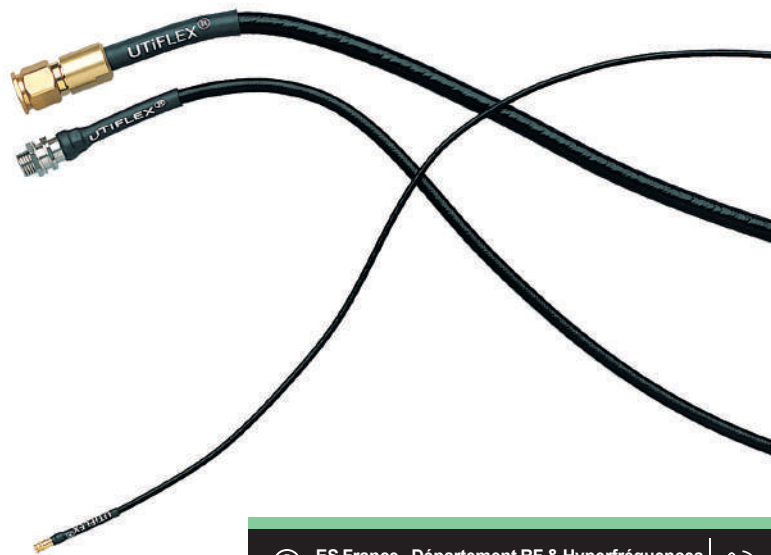
- » Thermal Shock per MIL-STD-202, Method 107, 20 cycles, -65 °C – 165 °C, or MIL-STD-810, Method 503
- » Vibration per MIL-STD-202, Method 204, Test Condition B
- » Humidity per MIL-STD-810, Method 108
- » Salt Fog per MIL-STD-810, Method 509
- » Sand & Dust per MIL-STD-810, Method 510
- » Stress Crack Resistance per MIL-DTL-17, Paragraph 4.8.17
- » Cold Bend per MIL-DTL-17, Paragraph 4.8.19
- » Chemical Resistance
  - JP-4 and JP-5 fuels
  - Hydraulic fluid
  - Lubricating oil
  - Coolants of fluorocarbon, silicon, silicate ester, & glycol families
- » Flammability per 14 CFR Part 25

Our in-house test capabilities include:

- » Mechanical
- » Visual
- » Temperature
- » Thermal Shock
- » Humidity
- » Real-time X-ray
- » RF shielding
- » Dynamic Flexing
- » Vacuum
- » Fully Equipped Microwave Test Lab for Frequencies up to 67 GHz



Mode stir RF-Shielding testing per IEC Standard 61000-4-21 Annex F



# Care & Handling

## General Instructions

UTiFLEX® Microwave Cable Assemblies are precision components that require proper use, routine inspection, and periodic cleaning of the connectors to maintain their reliable performance. Such care will increase the life of the assembly and all associated test equipment, as well as ensure more accurate and reliable measurements. Failure to observe these guidelines can result in inaccurate test data or permanent damage to both the assembly and other equipment. In addition to these instructions, an excellent resource for proper care and handling is the archived Hewlett Packard Application Note 326, “Coaxial Systems: Principles of Microwave Connector Care.”

## Cable Accessory Handling

- » Always observe specified cable minimum bend radius, especially at the ends of the connector strain-reliefs where excessive stress may not be obvious. Failure to do so may result in permanent cable performance degradation.
- » Our cables are designed to withstand heavy use, but avoid pinching or crushing the cable, and do not drop heavy objects on the cable.
- » Never pull the cable when connected, or use it to support any additional weight.
- » Maintain a clean and dry test environment whenever possible. Foreign particles or chemicals can damage interconnects and should be avoided/prevented whenever possible.

## Connector Handling

- » Periodically (ideally before every critical test), inspect all connector interfaces. If necessary, clean out the connector interface by first blowing with compressed air. If contamination remains, use a cotton swab slightly moistened with isopropyl alcohol to remove impurities, then allow to dry before testing. If any part of a connector interface becomes damaged, the connector should be replaced to prevent permanent damage to other components.
- » Mechanically inspect all connector interfaces using a calibrated gage to ensure that the interface is in compliance with its controlling standard.
- » Always align connector centerlines before attempting to mate. Take care to perform this step properly as any required play in the coupling nut may allow the threads to mate without proper center contact insertion. This could damage or destroy critical connector components.
- » When threading male coupling nuts, ensure that the female component remains stationary while threading the male coupling nut onto the threads of the mating interface. Otherwise, unnecessary wear will occur on both connectors causing degradation of measurements.
- » Always tighten connectors to the required torque using only the correct and properly calibrated torque wrench. Make sure the wrench is held perpendicular to the connector centerline, as tilting tools or connector components will cause damage. Tighten slowly to ensure that the ratchet mechanism on the wrench engages at the true torque value. For knurled nuts, finger-tighten only.
- » When nearing full mate, apply a backing wrench to the connector's wrench flat to prevent any twisting or turning of the connector and/or cable.



Applications Engineering

Our applications engineering staff is available for technical support in the design, utilization, testing, and production of any UTiFLEX® Cable Assembly.

Prototype Capability

Samples can be manufactured for specific applications and supplied to you promptly. If new connector or cable designs are required, our experienced staff can offer a quick turnaround.

Qualification Testing

We can economically perform all qualification testing and document required testing procedures.

Program Management

We have participated in many large military and commercial programs. We maintain complete program management capability necessary to successfully complete development and production of projects of any size.

Warranty

All UTiFLEX® cable assemblies have a limited one-year warranty subject to our review.

How to Order

Please order by UTiFLEX® part number (see page 25) and/or drawing number, adding any special requirements. Your order should include the length required, connector type, and frequency range. Our webstore is the quickest way to order and receive custom configured test cables.

Where to Order

Amphenol CIT  
206 Jones Boulevard  
Pottstown, PA 19464-3465  
Phone: 610.495.0110  
Fax: 610.495.6656  
E-mail: Pottstown.Sales@CarlisleIT.com  
Web: Amphenol-CIT.com

Terms

Formal price quotations remain in effect for 30 days unless otherwise specified on quotation. Terms of payment are Net 30 days and subject to credit approval.

Shipments

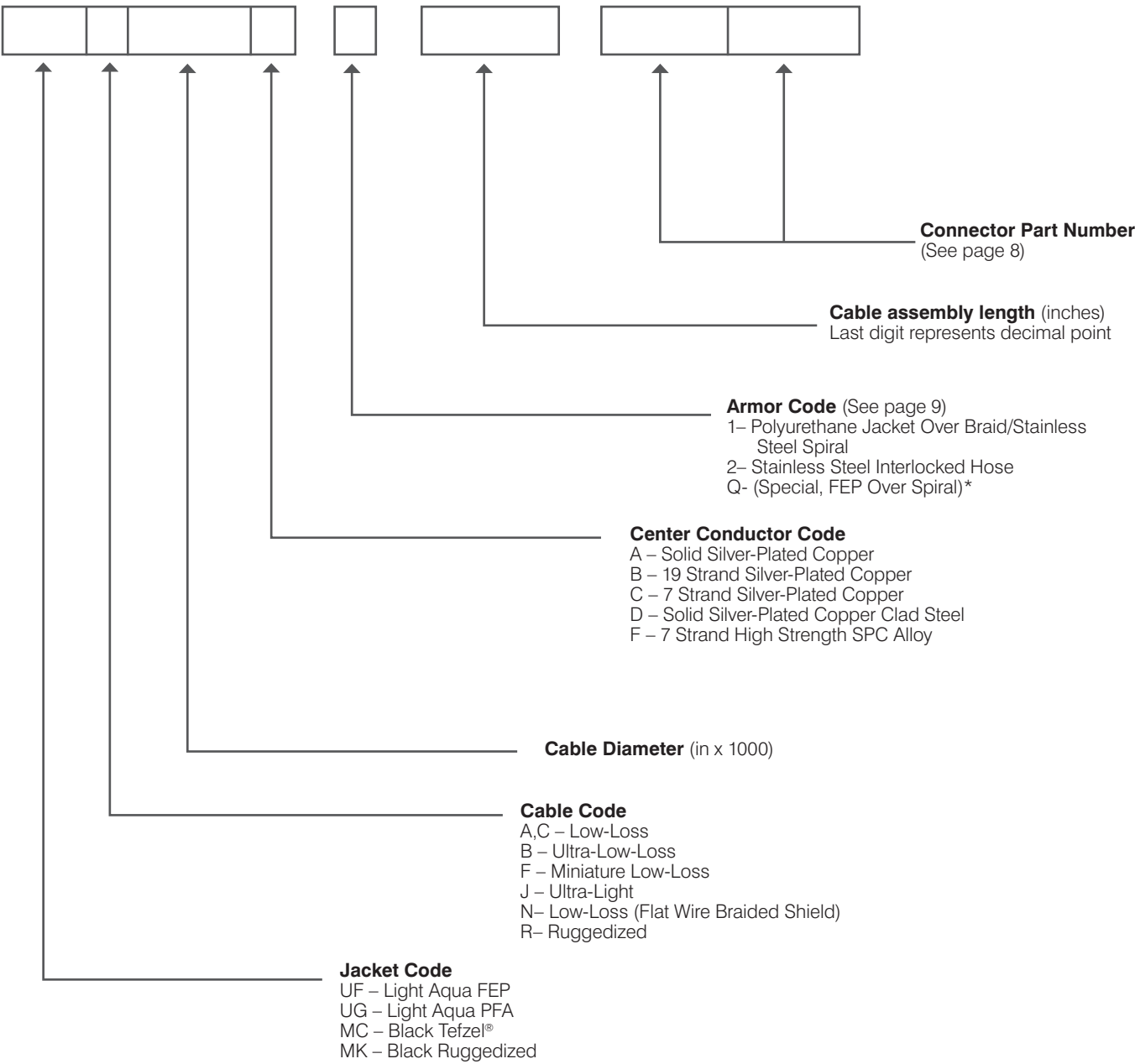
Unless specific instructions accompany the order, shipment is made FOB Pottstown, PA. We will use our judgment as to the best method of shipment. We reserve the right to ship COD or upon receipt of advance payment. All claims of shortages must be made within 10 days of receipt of material.

Return Policy

Please contact us for an RMA number before returning product. The RMA should be referenced on the packing container and all associated paperwork.

Additional Information

Please visit our website at Amphenol-CIT.com.



Examples

**UFA210A-0-0360-300300**  
FEP jacketed, low-loss, 0.210 in diameter cable, solid silver-plated copper center conductor, no armor, 36-in long, SMA plug connectors on each end.

**UFB293C-2-0105-504310**  
FEP jacketed, ultra-low-loss, 0.293 in diameter cable, 7 strand silver-plated copper center conductor, stainless steel interlocked hose armor, 10.5-in long, precision N plug by SMA jack connectors.

DuPont™ and Tefzel® are trademarks or registered trademarks of E.I. du Pont de Nemours and Company.

# We Are Interconnect.

At Amphenol CIT, we do more than make interconnect technologies for a spectrum of industries. We deliver the critical connections and products that make amazing performances possible.

# Global Manufacturing. Local Support.

Wherever you are, so are we. With manufacturing centers around the globe, our highly qualified team is up to any challenge. Our extensive worldwide manufacturing capabilities, coupled with end-to-end local project management and engineering support, allow us to design, build, test, and certify your product in-house, saving you the time and hassle of managing multiple vendors.



The Continuous Improvement System (CIS) serves as the driving force behind our sustained growth, excellence, and longevity. It forms the foundation of our commitment to continual enhancement and sustainability. Through CIS, we steer our strategic evolution, achieve annual cost efficiencies, and ensure alignment between business objectives and operational excellence.

At its core, CIS functions as our universal compass, fostering a shared language and transparent methodologies. It provides the framework to set the course for progress and equips us with actionable metrics to measure our journey. With CIS, we manage improvement systematically, ensuring timely resolution of challenges and nurturing a culture of stewardship and sustainability.

In essence, CIS embodies our ethos of relentless improvement, offering the structure and tools necessary to navigate the complexities of our evolving landscape while remaining true to our core values.

## Key Sustainability Efforts

- » **Sustainability Initiatives:** Targeting waste and emission reductions for Amphenol CIT, customers, and the environment.
- » **ISO 14001 Compliance:** Adhering to environmental standards, identifying and reducing waste and emissions.
- » **ISO 50001 Energy Management:** Optimizing energy usage, transitioning to greener energy sources, and identifying energy conservation measures.
- » **Reduce, Recycle, Reuse:** Implementing strategies to minimize waste and promote resource conservation.

## Key Continuous Improvement Efforts

- » Employee Engagement
- » Policy Deployment
- » Value Transition Planning
- » Managing for Daily Improvement
- » Enterprise-wide Lean Sigma
- » Variation Reduction
- » Supply Chain Excellence
- » Engineering Excellence

## Our Family of Brands



## FACILITIES CERTIFICATIONS



Visit our website to view certifications listed by site.

## HEADQUARTERS

100 Tensolite Drive  
St. Augustine, FL 32092  
United States  
1 (800) 458-9960

## PRODUCT CERTIFICATIONS



Contact us directly for products engineered to your specific compliance needs.

