



# CABLE ASSEMBLIES

## OMNETICS CABLE HARNESS SOLUTIONS

Omnetics specializes in miniature connectors and small wire gauge interconnects and is well suited to meet the cable harness needs of our customers, with IPC-610 and IPC-620 trained workers on-site.

## HASSLE-FREE

A wide range of cable and wire configurations are available

## CUSTOMIZATION

Omnetics' cable assemblies are 100% customizable

## RELIABILITY

## Omnetics' techniques enhance ruggedness and durability



## OUR EXPERTISE

**Omnetics specializes in application-specific connector to cable systems. Our expert designers have experience designing harnesses for complex and harsh environment applications. Omnetics designers have the necessary experience needed to meet the Quality and Performance specifications required by the US Military, NASA and ESA.**

Our experience with all types of connectors and cables in a wide array of markets means Omnetics will satisfy your cable harness needs.

Omnetics works directly with you to determine the proper material for your application. Materials such as FEP, PFA and PTFEs suit aerospace applications. PVCs, Urethanes, and Silicone jackets are standard selections. We also have experience with a wide range of Customer Supplied materials.

When cable flexibility is important, high performance copper alloys or copper conductors with 19 or more strands are used.

High strength copper alloys will increase the wires break strength. Another option is to use a Kevlar or Nomex strength member to increase the break strength of the Harness.

To finish off the bundle, Lacing tape and heatshrink tubes are available; these help improve the harness flexibility and ease of routing.

Cable and Harness shielding are critical to the function of the connected device. Typical shielding methods are braided shield, spiral shield and a foil shield with or without a drain wire. There can also be combinations of the methods, for example, it is common to braid over a foil shield with a drain wire. Each shielding method has its place depending on the desired EMI performance.

One specialty at Omnetics is our coax and higher speed digital cable offered to match key requirements, such as impedance, differential signal management and wavelength of the signals. A mixed signal cable offers a variety of power, coax and or higher-speed in a compact custom connector. These designs save space and weight. Our specialists in hybrid cable and connectors are ready to discuss these great options with you.

Flexibility, tensile strength, patient wear-ability, biocompatibility, flame retardant, flex life, sterilization, shielding and signal integrity, lightweight and more.



## OUR CAPABILITIES

**We design and manufacture a wide range of custom cable solutions to support all of our various product lines, while allowing your team to guide the design.**

To minimize the design cycle time, Omnetics utilizes engineer-to-engineer communications. Omnetics will be available to assist your team from the developmental stages, to prototyping all the way through production. Omnetics' Design Engineering Team uses SolidWorks.

Omnetics does not typically charge for our engineering services which allows our customers to explore solutions to their interconnect challenges without having to generate POs or go through lengthy approval processes.

We are able to offer step files, printed prototypes and drawings prior to finalizing the design. This minimizes customer risk and results in successful implementation for prototype and production assemblies.

Omnetics Connector Corporation follows IPC/WHMA-A-620 for all cable assembly, test and inspection practices.



## Custom Cable Assembly Options

- Wire-to-wire jumpers
- Complex multi-branch assemblies
- Mixed Signals and Power and/or Coax
- Data & Video Cables
  - HDMI, CAT-6, USB 3.0, Cameralink
- Custom Overmolded Cables
  - Custom Logos and branding
  - Strain relief and unique geometries
  - Waterproof sealing (i.e. IP68)
- Flat Cable/Ribbon Cables
- Flex Circuit Assemblies
- Shielded Cable Assemblies
- RF/Coaxial Cable Assemblies
- Medical Device Cable Assemblies
  - ISO 7 cleanroom
  - Autoclavable
- Military Connectors
  - MIL-DTL-32139 / -83513 / -24308 / -38999
- Space Wire
  - Cable per ESCC 3902/003
  - Assemblies per ECSS-E-ST-50-12C Rev. 1
  - Type A and AL

## Cable Assembly Processing Capabilities

- Wire to wire connectors
- Wire to board connectors
- High speed performance simulations
- Single and multi-row connectors
- Winding ferrite rings or chokes
- Ring terminals
- Ferrules
- Splicing and butt connections
- Standard and gold plating options
- IPC-620 compliant crimping connections
- Potting/encapsulation
- Automated and manual crimp stations available
- Precise cut lengths
- Machine and slip-on Braiding options available
- Injection Molding
- Tie and Lacing
- Custom Wrapped Tapes and Foils
- Overmolded Strain Reliefs
- Soldering
- 3D Printing
- IPC-620-Space Addendum

## Testing

- Full electrical Test – IR, DWV, Continuity
- Pull Testing
- Crimp Testing
- Temperature Cycling
- IP Testing
- Group A
- Group B
- Qualification Testing

# CABLE HARNESS CHECK LIST

In many cases, connector and cable designers must ensure their interconnection equipment is designed to survive and perform well beyond the standard specifications in truly extreme environments.

By using a checklist to compare potential hazards, one can define what connector materials to use. This list helps a designer determine what method of latching, sealing or insulating will be required. Each portion of the connector and cable should be reviewed against the list. Frequent reference to the harsh-environmental conditions will keep design on track and assure better performance in the end. Sitting down with our designer and going through the demands help define the connectors and cables that fit best.

**O1**

## Mechanical design related elements

- Shock
- Vibration
- Physical abuse
- Locking mechanism
- Water Seal – depth and length
- Connector - open or closed
- Corrosion resistance

**O2**

## Electrical performance

- Connections
- Number of mates and de-mates for life
- Electrical breakdown resistance
- Signal integrity
- EMI

**O3**

## Environmental

- Temperature
- UV or infra-red exposure
- Petroleum exposure
- Other chemicals
- Dust
- Outgassing of materials

**O4**

## Cable

- Bend radius
- Stress in length
- Repeated motion (ie. robots)
- Crush under pressure
- Immersion



## CORE STRENGTHS

---

Most common wire is focused on high strength, highly flexible, small diameter wire:

- 26 AWG Teflon insulated multi-strand cable or open wiring
- 30 AWG Teflon insulated multi-strand cable or open wiring
- 32 AWG Teflon insulated multi-strand cable or open wiring
- Purchased or customer supplied wiring
- Thermo-couple wiring
- Polyimide Flex cable
- Fabric braided cable for high flex
- Flat ribbon wire
- Flex circuit interconnections
- Board to circuit and board to board
- Looping cable for stacking board interconnections

## OUR EXPERIENCE

---

Omnetics cable harness solution design and manufacturing experiences have included:

- Cables from micro to nano-sized connectors
- Hybrid signal and power connectors
- Mixed signal power and signal to Omnetics mixed signal circular connectors
- Wiring and cable harness from modified connectors to standard connectors
- Wire harness with mixed-signal wiring for power and signal to other D-shaped connectors
- Circular 38999 connectors wired to Omnetics micro/nano connectors
- Cochlear interconnect harness to nano connectors

**sales@omnetics.com**

**+1 763-572-0656**

**OMNETICS**  
CONNECTOR CORPORATION