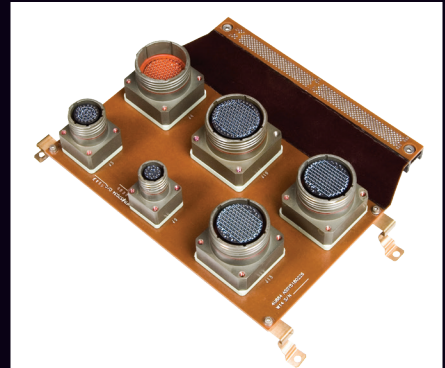
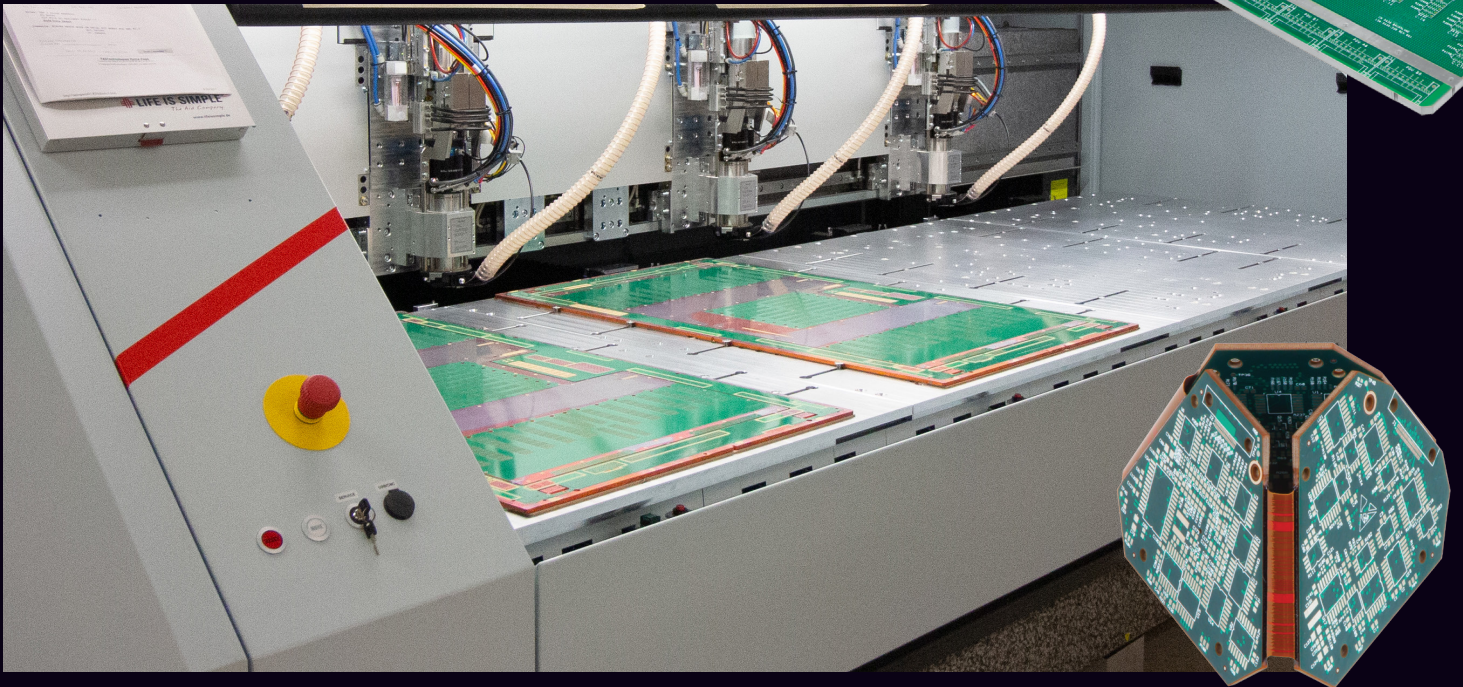


# Printed **CIRCUIT** Board Technology

Amphenol Printed Circuits is a World Leader in the Printed Circuit Industry for Military and Commercial Markets.



# About Amphenol Printed Circuits



Amphenol Printed Circuits is a world leader in the printed circuit industry, building PCB's, Backplanes, Flex and Rigid Flex products to meet our customers' demanding needs. Amphenol Printed Circuits' (APCs) capabilities are among the world's broadest and most advanced, delivering consistent quality and reliability for demanding high-bandwidth systems and mission critical applications for more than 30 years. Proven engineering and manufacturing expertise eliminates design obstacles. The 214,000 square foot New Hampshire facility features state-of-the-art PCB manufacturing equipment and optimized material handling to ensure the highest quality and consistency. Our Flex and Rigid-Flex assembly located in Nashua, New Hampshire and Nogales, Mexico are fully ITAR qualified.

## Certifications

- ISO 9001
- AS9100
- NADCAP
- MIL-PRF-31032
- MIL-P-55110
- MIL-P50884
- ITAR Registered
- IPC-A-600
- IPC-A-610
- IPC-6012
- IPC-6013
- UL
- J-STD-001
- Program Management

Learn more about Amphenol's products and application abilities by visiting us online or contacting us at...

**603-324-4500**  
**[www.amphenol-apc.com](http://www.amphenol-apc.com)**



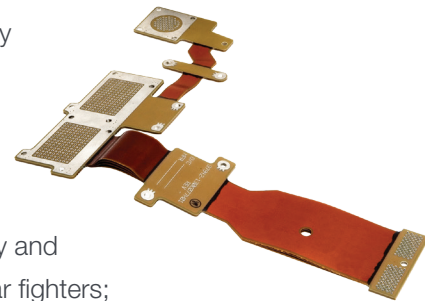
# Industry Leader...

in Manufacturing of Rigid, Flexible and Rigid-Flex  
Circuit Interconnects



APC's North American printed circuit operation provides tightly controlled processing working to meet your needs for initial prototype and mock-up builds through full rate production. Our ability to produce all types of rigid PWB's as well as Flex and Rigid-Flex, and our unparalleled connector offerings, sets us apart and allows us to support your programs at every interconnect level through a single point of contact.

For over 30-years APC has been delivering highly reliable products to all industries where quality and dependability are crucial to success. From commercial airplanes, to high-end servers to our war fighters; APC's commitment is to deliver products that work right the first time, every time.



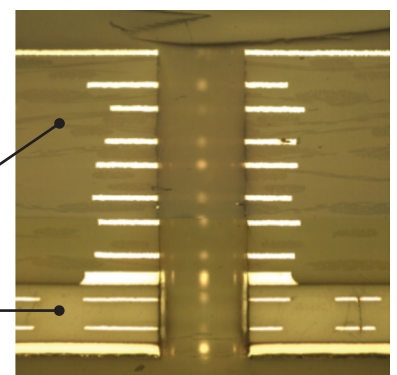
- **Rigid Flex**
- **Backplanes**
- **Flex**
- **RF PCB's**
- **Design Services**
- **Large Format**
- **20+GB/s**
- **20:1 Aspect Ratio**
- **High Layer Count**
- **Turn-Key Assemblies**
- **Stacked**
- **Bookbinder**
- **Laser Drilled**
- **Blind & Buried**
- **Precision Backdrilling**
- **Backdrill**

## Hybrid Construction

In today's cost conscious environment hybrid RF applications are working as cost alternatives while incorporating high-performance materials with digital and analog materials in the same design to lower cost and increase efficiencies.

Nelco 4000 - 13

LCP



# Design Services

APC's design services are geared for manufacturing cost reduction, improved reliability, and enhanced performance as well as overall space and weight savings. Real time modeling ensures design fit as well as increased collaboration.

- Cadence Allegro software for PCB & Flex Design
- Polar Impedance Modeling & Design
- CAD/CAM, DXF, Gerber, ODB++-, Step files
- DRC & DFMA Tools
- On-Site Design/Application Review
- Material Evaluation & Recommendations
- S.I. Analysis & Simulation
- Frontline Genesis
- Solidworks
- Physical and Electrical Constraint Driven Design
- Rules based – routing rules based on design parameters
  - Provide us with (standard default is IPC-2221/23)
  - Net List
  - Parts List
  - Physical limitations



## We will provide

- Full Gerber database
- DFM report
- Impedance modeling

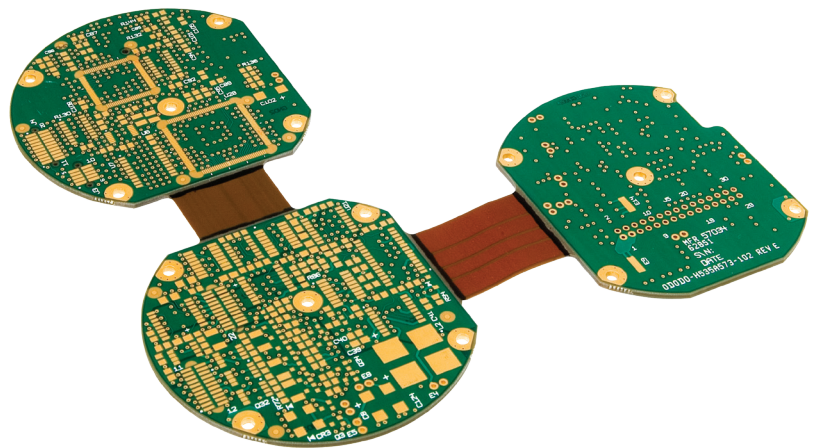
## MATERIALS

### Rigid

- High & Low Tg FR4
- Rogers 3000, 4000 & 6000
- LCP
- Polyimide
- Megtron 4 & 6
- Nelco 4000-13, EP & SI
- Itera

### Flex

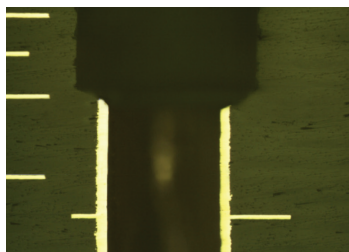
- Polyimide Ap, LF, FR & TK
- High-Temp





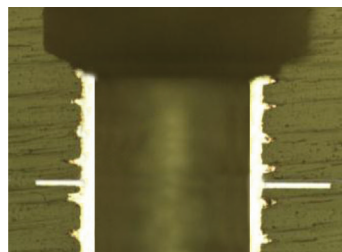
# Backdrill Capabilities

By removing the unused portion of copper from the barrel of Plated Through Holes used for high-speed signal lines, the signal quality can be increased by reducing the attenuation caused by the excess copper in the barrel. Primarily used on backplanes, this practice has started to become more common on Daughtercards and Rigid-Flex.



## Standard

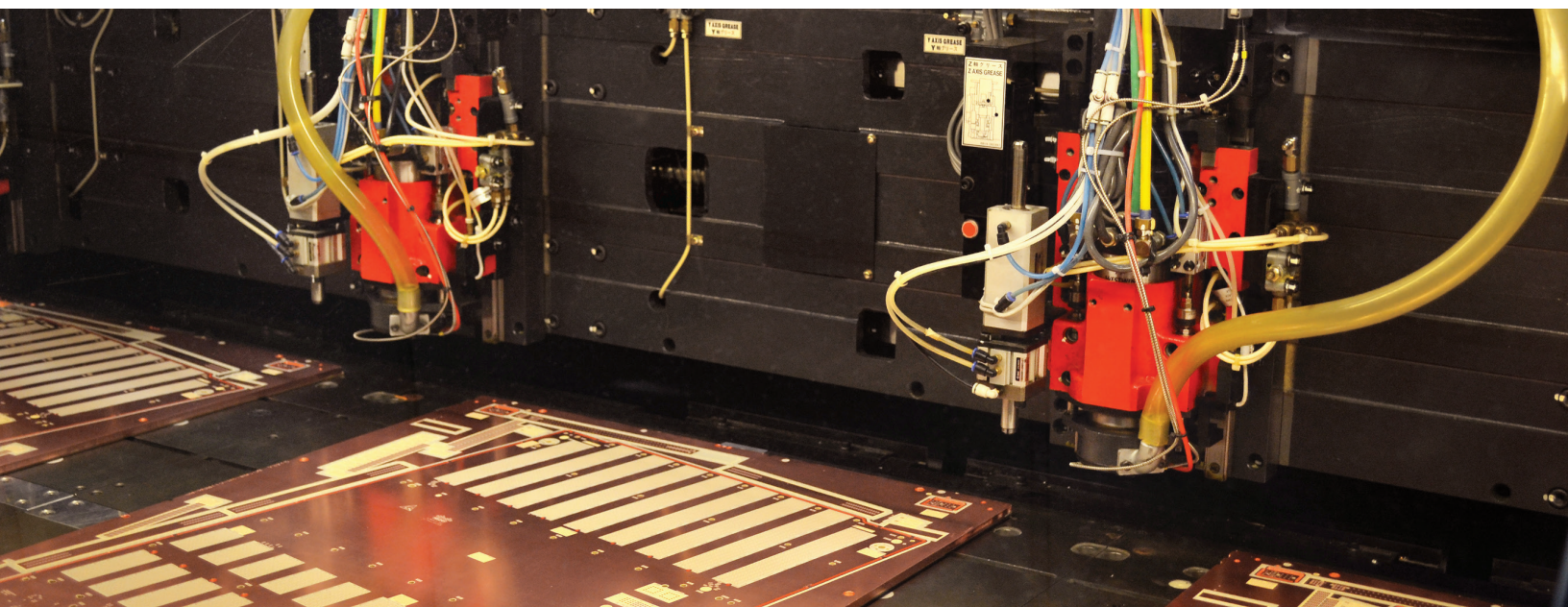
.016 - .028 Stub Length  
+/- .010 Depth Control



## Advanced

.006 - .010 Stub Length  
+/- .001 Depth Control

- Higher speeds 25GB/s+
- Tighter Impedance controls +/- 2%
- Eliminate the “Antenna Effect” in the via structure
- Tighter control of differential pairs
- Done through process control



# Assembly and Advanced Manufacturing

## Assembly Capabilities

- Turn Key
- Through-Hole – Wave & Manual
- SMT
- Wire-Bond
- Crimp
- RoHS
- Press Fit/Compliant Pin

## Assembly Finishing

- Conformal Coat – UR, Acrylic, Parylene, Fluoropolymer
- Potting – Stycast, Eccobond, 3M
- Over molding
- Glob Top
- Heat Forming
- Heat Sinks



## Advanced Manufacturing – High Speed

Currently building high layer count (60+) Backplanes which are performing at >20GB/s speeds.

Unique equipment allows us to process large form factor panels with excellent utilization up to 24x54 panels.

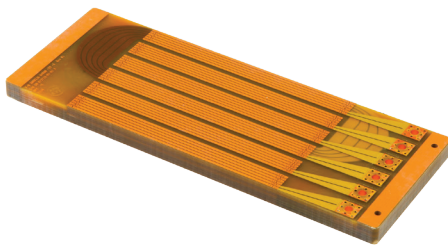
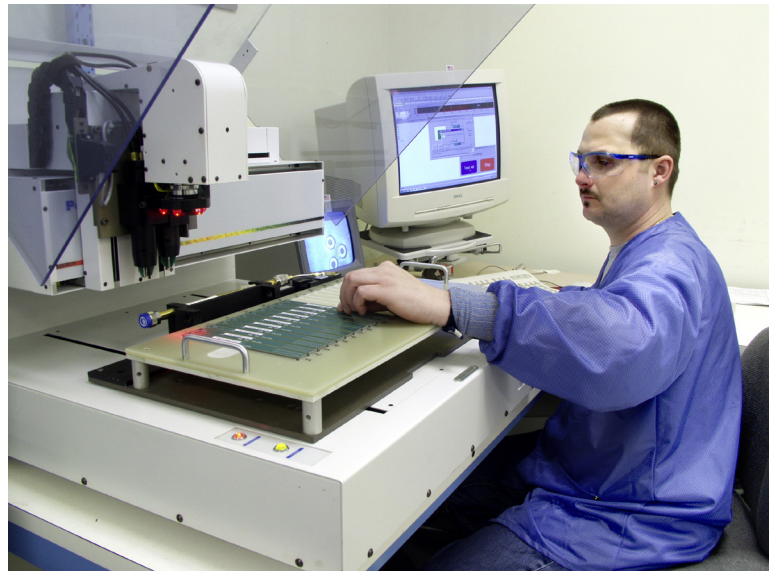
High speed materials include Megtron-6, Nelco-13SI, and Rogers 4000 – including “hybrids” for lower cost options.



# Test Capabilities and Large Panel Sizes

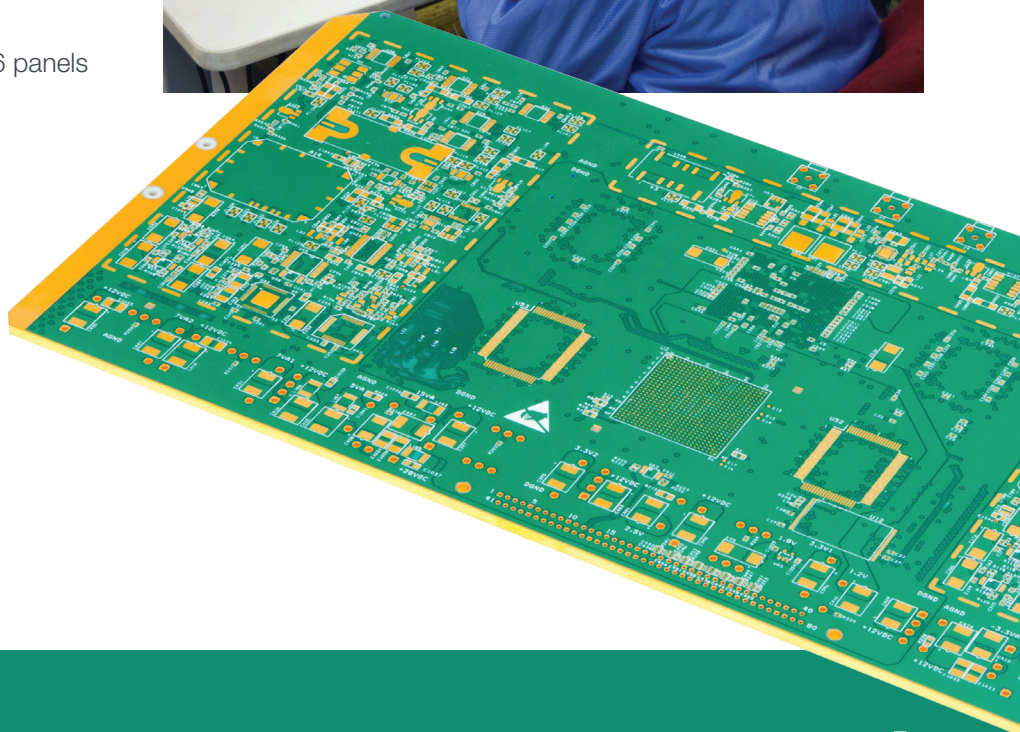
## Test Capabilities

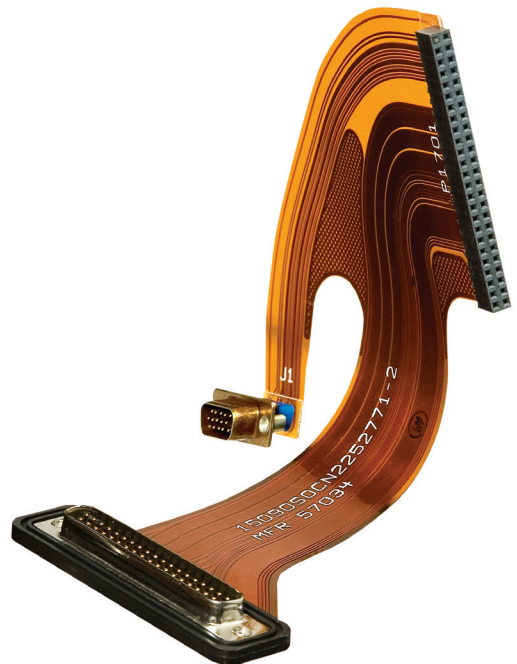
- Impedance Testing
- Hi-Pot up to 5,000 VDC 2,000+ test points per circuit
- Insulation resistance up to 1,000 VDC
- Four-Wire Kelvin  $.001\Omega$  to  $1\text{ M}\Omega$
- Functional Testing
- Bed of Nails, Flying Probe Panel & Layer Test
- Assembly Test Fixtures
- Flexibility Cycling
- Environmental Testing



## Large Panel Sizes

- Due to our large format capabilities we are able to routinely build Rigid Flex on 24 x 36 panels
- Cost and size are the two main features of large format Panels
- Customers are able to design less interconnects and benefit by combining backplanes and rigid flex





**Amphenol Printed Circuits**  
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Nashua, New Hampshire  
03062

**603-324-4500**  
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