

## High Density Interconnect (HDI) Flexible Circuits

**MINCO**  
A critical component of your success™

# The many reasons to choose Minco HDI flexible circuits

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A critical component of your success™

With over 75 percent of our flexible circuits going into medical, aerospace and defense applications, Minco has the systems and processes in place to assure you of consistent product every time you order.

Minco is a supplier with over 35 years of flexible circuit experience focusing on components for critical applications.

With Minco's state of the art facility and equipment; ISO 9001:2000 and AS9100B certifications, Minco can provide you with High Density Interconnect (HDI) flexible circuits with unmatched features and performance.

Additionally, Minco's IPC-certified designers can help you improve reliability and help make your designs easier to build—without sacrificing performance. With our Engineer-to-Engineer (E2E) approach to service, design assistance is available when you are ready to start a new project.

## State-of-the-Art Manufacturing Equipment

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Minco is fully HDI-capable with state-of-the-art manufacturing equipment. Minco's in-house facility can perform all the major processes for manufacturing circuits with microvias and fine line widths:

- ▼ **Laser Drill**
  - Microvia formation down to 50 micron
  - Laser scoring for accurate part footprint
- ▼ **Laser Direct Imaging**
  - 25 micron line width capability
  - Bed capability to support 18" x 24" (45.7 cm x 61 cm) panel
  - ±12 micron registration accuracy
  - Class 1,000 clean room environment
- ▼ **Copper Plating**
  - 12:1 thru-hole plating aspect ratio
  - 1:1 blind microvia aspect ratio
  - Thin material transport system
  - 4% CV surface and hole thickness uniformity
  - 50 micron finished microvia formation
- ▼ **Automated Optical Inspection**
  - 45 micron etched feature inspection
  - Sensitive to part to part irregularity
- ▼ **Electrical Verification**
  - Impedance testing available
  - Automated electrical testing: minimum test pad size of 100 micron, pitch of 175 micron

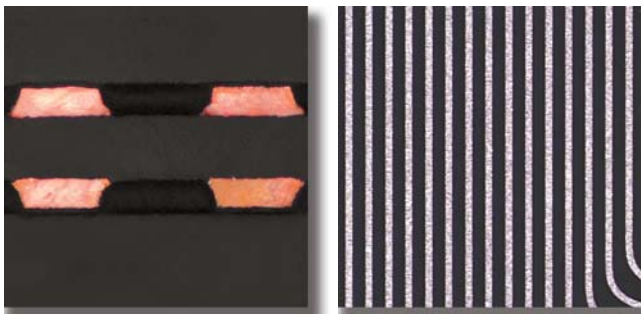
## Benefits of Microvias & HDI Circuits

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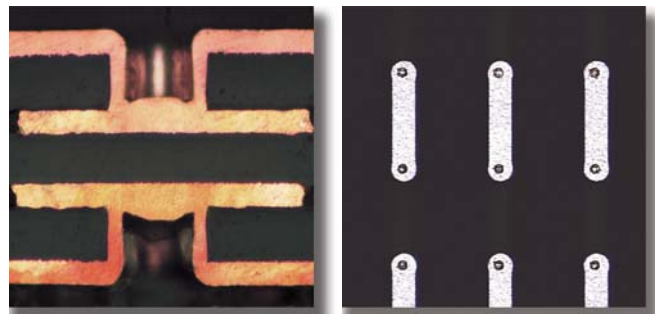
High Density Interconnect (HDI) flex circuits offer designers the same benefits of flex circuits—smaller, more reliable products—except at a higher level. In addition to the design benefits of HDIs and microvias listed below, HDI circuits give you more design, layout and construction options helping you finish your design in less time.

- ▼ **Lower cost and smaller size**—increased circuit density can eliminate extra layers and save up to 40% compared to non-HDI designs.
- ▼ **Use advanced component packaging**—high-I/O and fine-pitch feature capabilities possible with HDI.
- ▼ **More design options and flexibility**—blind and buried microvias allow for conductor routing on the internal layers under vias, creating more usable design space per layer.
- ▼ **Improved electrical performance and signal integrity**—microvias in high-speed circuits improve electrical performance by allowing shorter circuit paths, stub reduction and lower cross talk and noise.
- ▼ **Improved thermal performance and reliability**—microvias lower the z-axis thermal stresses between adjacent layers.
- ▼ **Improved cost effectiveness**—Minco's 18" x 24" (45.7 cm x 61 cm) panel size maximizes circuit density to increase the efficiency of your assembly process.

## 75 Micron Traces

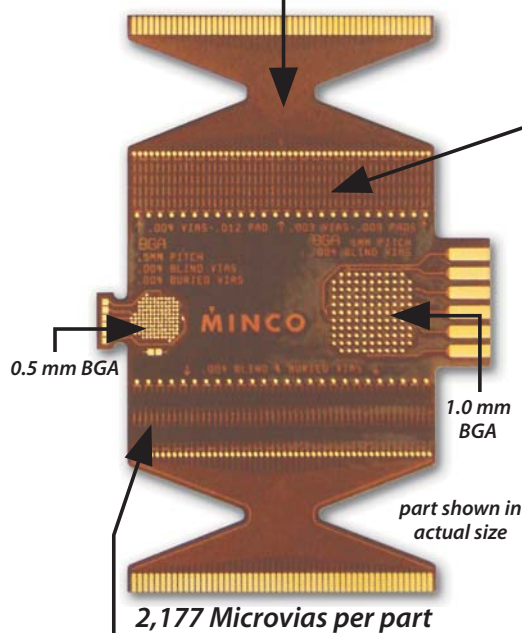


## 75 Micron Blind Microvia



· 9 micron copper

· 225 micron diameter pad  
· 75 micron laser drilled microvia  
· 50 micron finished via



## Minco HDI Design Options

### Specifications:

- ▼ Minimum microvia size: 75 micron, 50 micron finished
- ▼ Minimum microvia pad size: via diameter +150 microns
- ▼ Minimum line and spacing: 50 micron
- ▼ Microvia blind plating aspect ratio (depth to diameter): 1:1
- ▼ Minimum core dielectric thickness: 25 micron
- ▼ Minimum copper thickness: 9 micron
- ▼ Blind & buried via construction: sequential build technology
- ▼ Via fill: copper via fill available

## Blind & Buried Microvia Daisy Chain



- 100 micron laser drilled microvias
- 75 micron finished vias
- Blind & buried via construction

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