



Micro Systems Technologies  
engineering for life

A detailed, high-magnification microscopic image of a printed circuit board (PCB) surface. The image shows a complex pattern of green solder mask, yellow conductive traces, and various components including square and circular pads, some of which are populated with small electronic components. The layout is dense and intricate, typical of high-reliability PCB technology.

Bringing together  
experts in  
high-reliability  
PCB technology



**DYCONEX**

an MST company



# Process through PCB technology

At DYCONEX, we ensure that we have the right knowledge, quality, reliability and traceability so that our customers can fully rely on our technologies and our processes – all while complying with regulatory requirements. We rely on state-of-the-art equipment, cleanroom technology and highly skilled professionals.

## PRODUCTS

Your requirements are our challenge. We offer every type of leading-edge PCBs and organic substrates with the highest degree of commitment and flexibility. Full traceability is guaranteed from the lot level down to the individual print on a panel as well as for all base materials.

### Flex & Rigidized flex PCBs

Ultra-HDI multilayer flex PCBs
Ultra-thin materials
Ultra-fine line cables
3D miniaturization
Filled and stacked microvias
Buried, blind, staggered and stacked vias

### Rigid-Flex PCBs

Ultra-HDI multilayer rigid-flex PCBs
High-grade 3D miniaturization
Sequential and parallel build-ups
Versatile combinations of base materials
Thinned bending zones
Book binder build-ups

### LCP Substrates

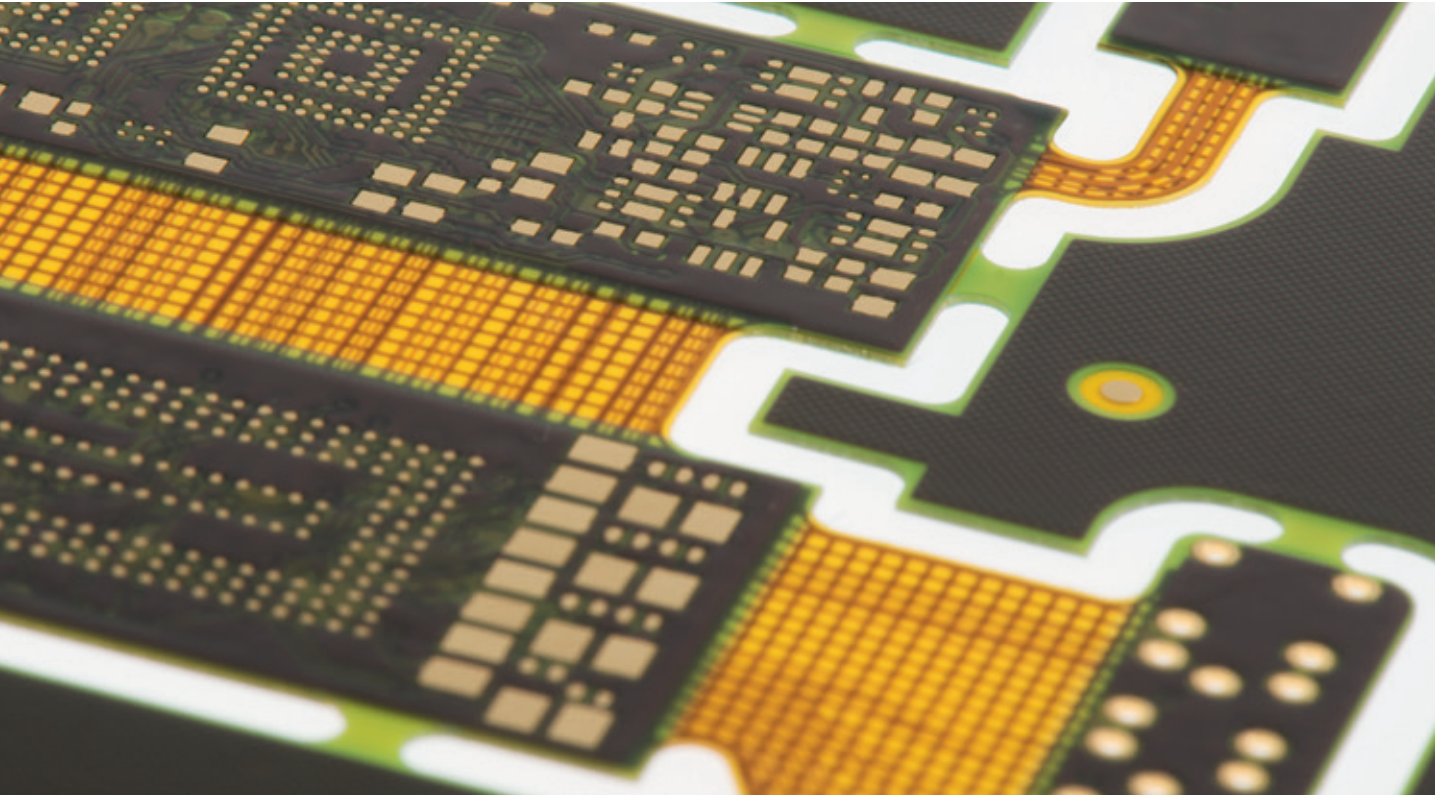
Very flexible thermoplast
Near hermetic due to very low water absorption
Temperature stable up to 190°C
Low weight
Excellent high frequency properties
Fully biocompatible base material

### Rigid PCBs

Ultra-HDI multilayer rigid build-ups
Buried, blind, staggered and stacked vias
Profiles, cavities, cut-outs and castellations
Low CTE materials
Thermal management solutions
Constraining materials such as CIC, CMC, CCC

### Packaging Substrates

Substrates for SDBGAs, CSPs, SiPs and MCMs
Ultra-thin materials for light-weight build-ups
Stacked vias and via-in-pad
High density pitch design
Die cavities
Anylayer or HDI technology



## PURE PASSION FOR ENGINEERING

Innovations and advanced technology development are an integral part of our corporate culture – continuously preparing for upcoming PCB challenges. Comprehensive engineering services throughout the product life cycle ensure optimized PCB solutions for your demanding needs.

### Miniaturization

Ultra-thin base materials
Ultra-fine line technology
Microvias, via stacking and filled vias
LDI technology
Advanced registration concepts
Thin film technology

### Functionality

Alternative conductors
High performance base materials
Folded systems
Embedding
3D shaping
Stretchable PCBs

### Biocompatibility

Biocompatible base materials such as LCP or PI
According ISO 10993-5 tested (in vitro cytotoxicity)
Thin film noble metal traces
For short term and long term implants
Embedding of active and passive components
Full module encapsulation by LCP

### Thermal Management

Wrap-around technology
Metal sheets as backpanels
Metal inserts and cores as heat sink
Thermal vias for heat dissipation
Copper filled microvias for high reliability
CIC technology to control thermal expansion

### High Frequency

LCP base material
Advanced rigid multilayer material
High Tg, low CTE and high dielectric strength
Impedance control
Highly reliable anylayer build-ups
Chip cavities for short wire bonds

### Reliability / Predictability

Design for reliability
Digital factory with full traceability
Integrated control and inspection concept
Two-stage approach to data processing
IST testing and analysis
Maverick control



# Adding value for highreliability industries

With its traditional, strong focus on the healthcare sector, DYCONEX understands the unique needs and characteristics of high-end, high-reliability customers. We manufacture under stringent conditions and according to ISO 9001, ISO 13485 and EN 9100 standard.

## MEDICAL TECHNOLOGY

### Medical Implants

With more than 20 years of experience in delivering high-end PCBs for life-sustaining active implants we are a reliable partner for this challenging market.

Pacemakers and defibrillators
Implantable monitors
Neurostimulators
Cochlear implants
Implantable pumps
Smart electrodes
Glaucoma implants

### Therapy Devices

We supply high-end PCBs to market and technology leaders in the hearing aid industry. From development to prototyping through serial production, customers rely on our ultra- HDI flex and rigid-flex PCB solutions.

Hearing aids (BTE, ITE, ITC, CIC)
Hearing support devices
Ventricular assist devices
Drug pumps
Drug delivery pills
Ablation catheters
Dialysis equipment

### Diagnostic & Medical Imaging

Substrates for medical imaging applications are technically extremely demanding. Ultra-fine line flex build-ups, ultra-fine pitch transducer pad arrays and high connection pad densities characterize these applications.

Ultrasound probes
X-ray detectors
CT scanners and MRIs
Smart catheters
Ingestible imaging capsules
Glucose meters
Endoscope technology





## INDUSTRIAL SECTORS

### Aerospace & Defense

Having its origins in the Swiss defense industry, DYCONEX has a genuine understanding of the challenging high-reliability characteristics and requirements of aerospace & defense electronics. DYCONEX is EN 9100 certified.

Civil aviation
Military aircraft
Radar technology
Satellites
UAVs
C4i applications
Missile technology

### Industrial

With a proven track record in various industrial segments, DYCONEX understands and responds to customers' varying needs throughout their products' life cycle.

Printing equipment
Sensor solutions
Micro motors
Measuring equipment
Control technology
Imaging equipment
Security solutions

### Telecommunication

DYCONEX PCB solutions address the increasing speed and density requirements of the telecomm industry. Our unique technology portfolio ranges from advanced material sets to dedicated design features.

Optical transceivers
RF switches
High-speed transmission control units
Phased array antennas
Low gain antennas
Interposer packages
High-speed cables

### Other Markets

Our technological expertise and the high level of quality assurance are reflected in all DYCONEX PCBs. These factors make us the partner of choice for any high-tech industry in the electronics sector.

Semiconductor packaging
Swiss electronic watches
Lab equipment
Transportation
Full-body scanners
Scientific applications
High-end computing



# Sustainable Swiss quality

Years of experience working in the field of life-sustaining medical devices and high-end industrial projects have led to our uncompromising quality management system. Our goal is to assure predictability in the manufacture of high-complexity PCBs. In order to meet this challenging expectation we have developed an integrated control and inspection concept allowing us to continuously improve our business and production processes.

## Quality Tools

The implementation of advanced quality tools and techniques provides accountability and is an essential ingredient in our effort for sustainable improvement.

Full traceability for every single PCB
First article inspection
8D reports
DOE, SPC and measuring system analysis (MSA)
Six Sigma methodology
Change management
IQ/OQ/PQ validation methodology
Corrective and preventive action (CAPA) process
Customized inspection concepts and reports
Maverick control

## Inspection & Test

Enabled through sophisticated equipment and skilled professionals, we are determined to supply only high-reliability, Swiss quality solutions to our markets.

100% electrical testing
Automated optical inspection
Automated final inspection
Micro-section control
Interconnect stress test (IST)
Bondability analysis
Ionic contamination measurement
X-ray inspection
FPC bending tests
Scanning electron microscope

## Approvals & Standards

Our approvals and quality management system demonstrate the ability to provide PCB solutions that consistently meet applicable customer and regulatory requirements.

ISO 9001, ISO 13485 and EN 9100 certified
Manufacturing and testing according to IPC standards and customer-specific requirements
Certified Six Sigma Black Belts and IPC qualified employees
RoHS and REACH compliance



## WHY CHOOSE DYCONEX?

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### Technology Leadership

- Delivering state-of-the-art interconnect technology with the highest degree of production flexibility
  - Significant investment in future technologies enabling your next generation development
  - Part of the Micro Systems Technologies (MST) group with a unique set of technical capabilities
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### Global Leader in Medical Flex PCBs

- Long-term experience in high-reliability PCB manufacturing for active medical implants, hearing aids and medical imaging applications.
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### High Performance in Quality and Reliability

- Quality systems and culture derived from Class III life-sustaining implant, aerospace and defense markets
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### Consulting and Technical Support

- Design for manufacturing, design-to-cost, design-to-performance
  - Prototyping services
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### Production Facility

- Leading-edge production and testing
  - Well organized manufacturing environment
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### Strong Financial Profile

- Privately owned, long-term perspective
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# About us



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## Your Reliable PCB Technology Partner

Based in Switzerland, DYCONEX AG is one of the world's leading providers of highly complex and highly reliable solutions in the area of interconnect technology. The company has its seeds in a 1964 founded division within Oerlikon-Contraves and acts as DYCONEX since a management buy-out in 1991. As one of the true pioneers in the industry, DYCONEX has continuously applied the latest technology to derive innovative technologies for various markets.

We provide a competitive edge for your business through our high-end interconnect expertise and we are an extremely reliable and predictable partner who can deliver products and services with premium quality.

Due to long-term dedication and expertise, DYCONEX has earned a solid reputation for being a technology leader and the partner of choice for providing leading flex, rigid-flex and rigid ultra-HDI/microvia circuit boards, LCP and chip packaging solutions.

DYCONEX is ISO 9001, ISO 13485 and EN 9100 certified and a company of the MST group.



## Micro Systems Technologies

The MST Group provides innovative solutions from concept to volume production for medical devices, in particular for active implants, which represent a special application area for MST products. In addition, other technologically advanced industries that demand exceptional performance and the highest level of reliability rely on the expertise of the MST Group. Its synchronized operating facilities – located in Switzerland, Germany and the United States – allow MST to be active worldwide and maintain global business relationships.

Just some of the products and services that the MST Group currently offers include: HDI/microvia PCBs, ceramic substrates, electronic module design and manufacturing, advanced assembly and semiconductor packaging technologies as well as batteries and battery packs for medical implants.

The MST Companies:

DYCONEX AG

LITRONIK Batterietechnologie GmbH

Micro Systems Engineering GmbH

Micro Systems Engineering, Inc.



MST Showroom



## DYCONEX

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