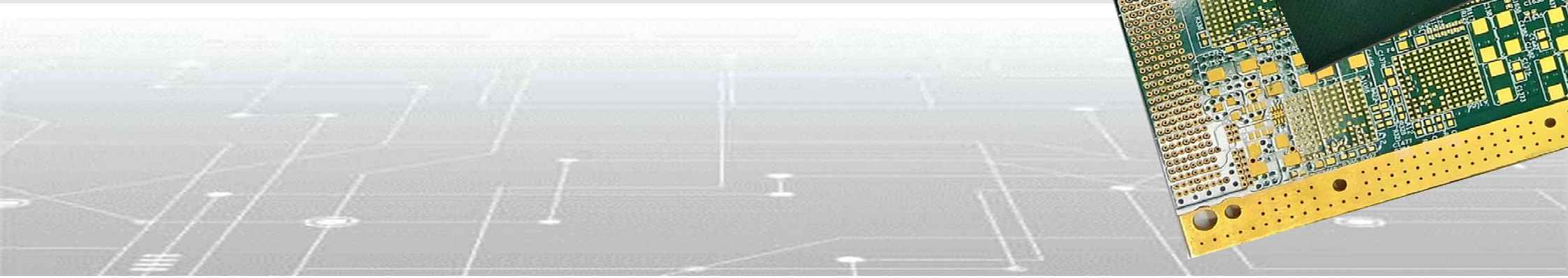
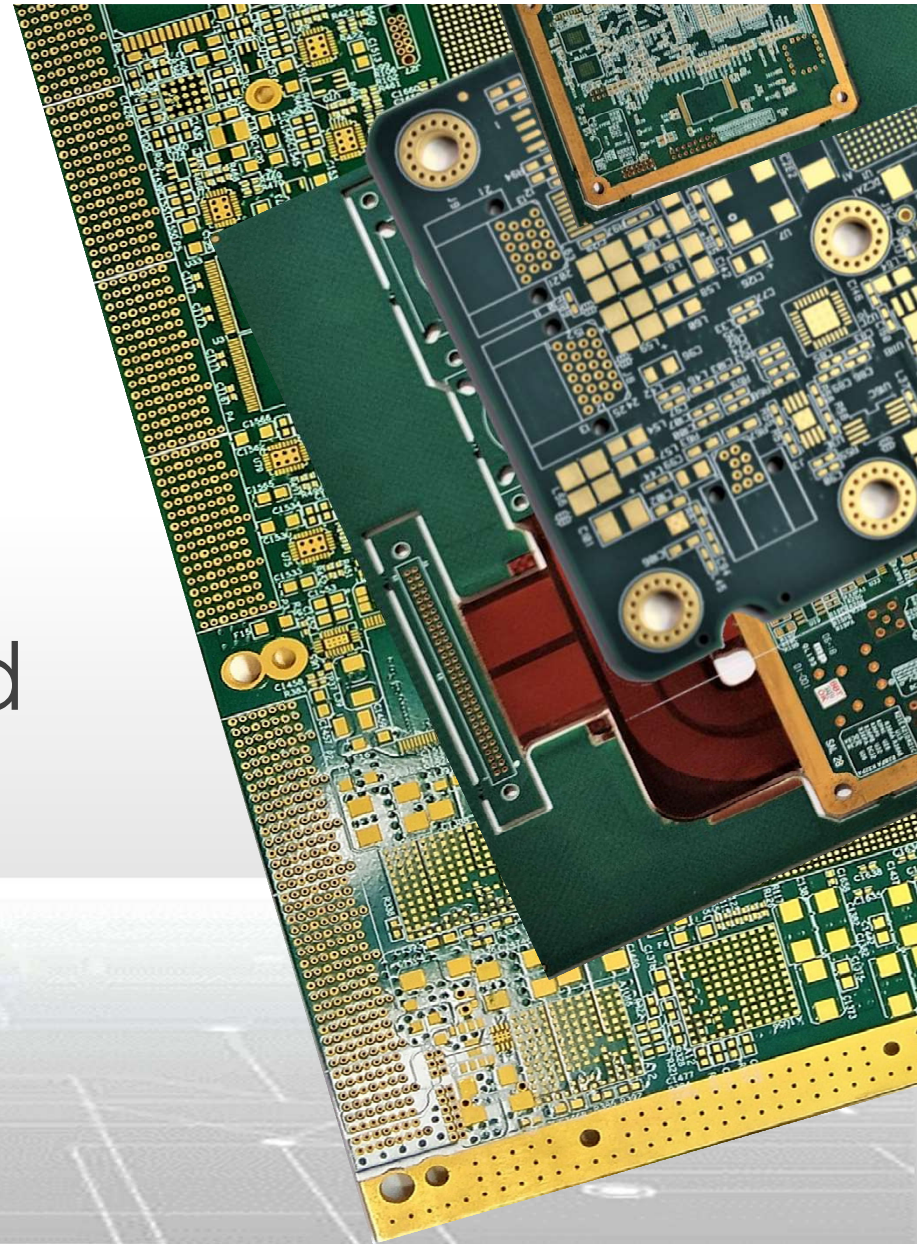


mp

Welcome to

Micropack Pvt Ltd



1984 Incorporated

1984 Multilayer PCBs

1987 Multilayer / Thermal Clad / Metal Core PCBs

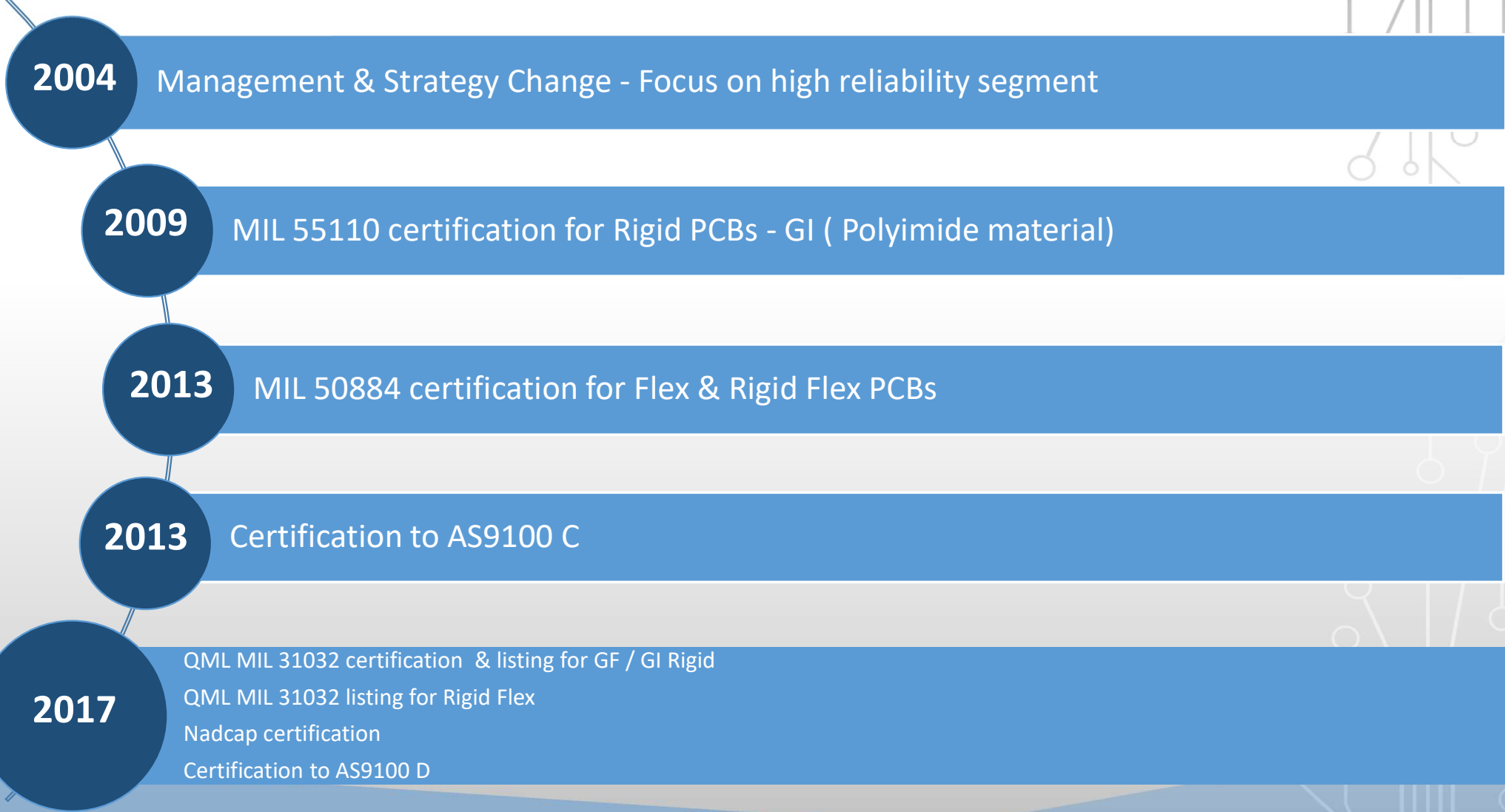
1991 MIL-PRF-55110 D certified for GF

1993 IECQ approval. First company in India to get IECQ approval

1993 ISO 9000 QMS certification

1999 Approved by ISRO for flight grade PCBs

History



2004 Management & Strategy Change - Focus on high reliability segment

2009 MIL 55110 certification for Rigid PCBs - GI (Polyimide material)

2013 MIL 50884 certification for Flex & Rigid Flex PCBs

2013 Certification to AS9100 C

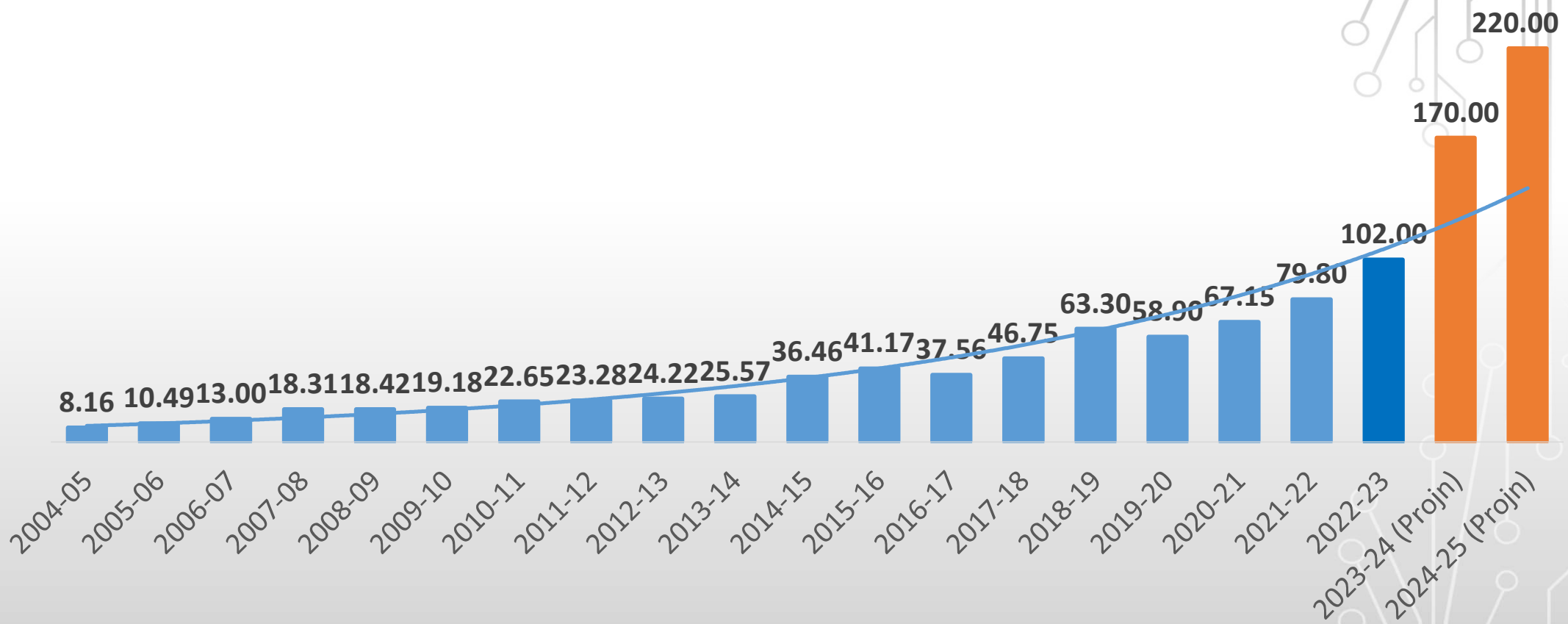
2017
QML MIL 31032 certification & listing for GF / GI Rigid
QML MIL 31032 listing for Rigid Flex
Nadcap certification
Certification to AS9100 D

Company Brief

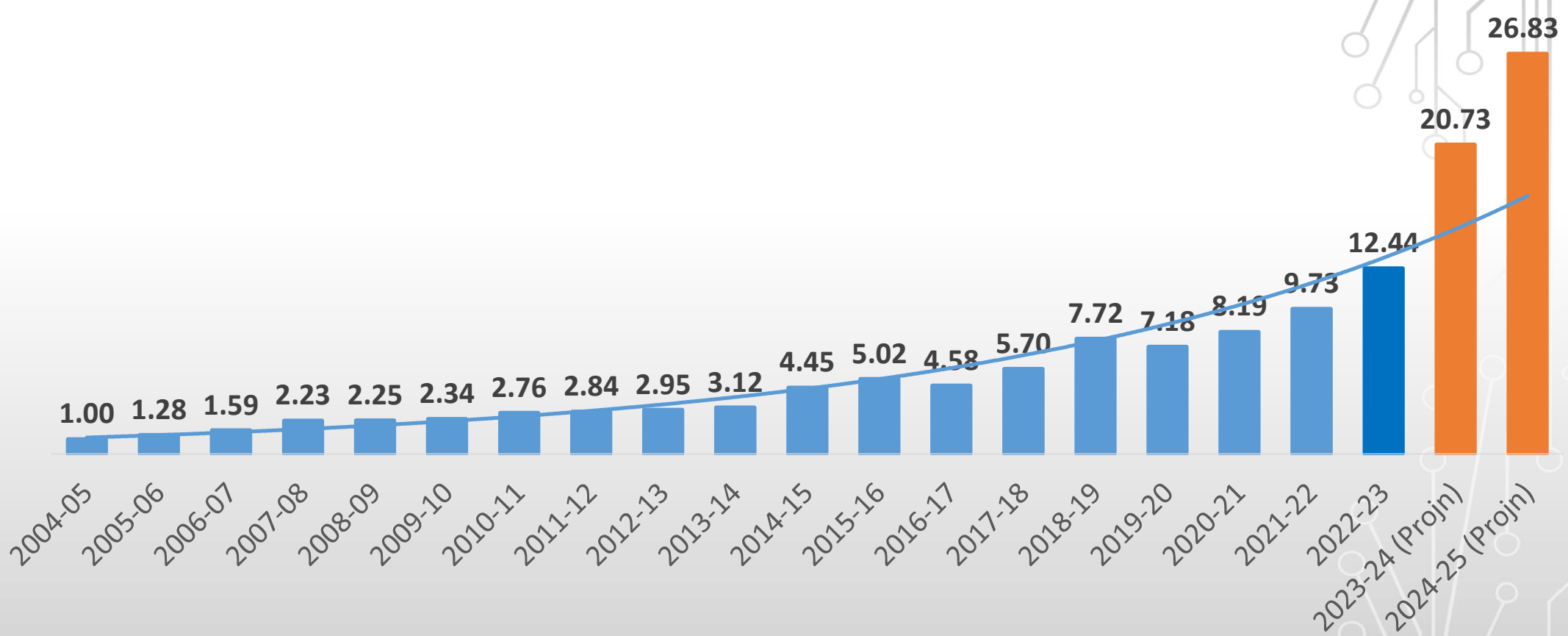
mp

- 100% privately owned Indian company
- Focus on fabrication of bare PCBs for Aerospace and Defence
- Strategy to focus on small volume / high mix segment
- Factory is located at Jigani Industrial Area, in Bangalore, in 10 acres of land with a built-up manufacturing area of 60000 Square feet
- Installed capacity of 50000 Square meters per annum
- 250+ employees, all technically qualified and trained to handle specialized processes
- Multilayer PCBs: Max. layer count manufactured- 38 layers
- Fabricates approximately 500-550 designs every month including 350-400 fresh designs
- In-house facility for all operations

Sales trend in Crores INR



Sales trend in Million US\$



- Micropack is a part of family-owned businesses
- Other business interests of the family include real estate and others
- Micropack's investments in the past has been for technology upgradation of the plant.
- In 2022, investments were also made for capacity enhancement to meet the expected market requirements for the next 3 years
- Post the capacity enhancements made last year, we are in a position to accommodate 3-4 times our current production and this gives ample scope for catering to new businesses and new customers
- Our focus on aerospace and other high reliability customers is to ensure continued compliance to the strict process controls

Financial Summary – Last 3 years

mp

				in Million US\$
	Provisional	Audited		
Particulars	31-Mar-23	31-Mar-22	31-Mar-21	31-Mar-20
Total Revenue	12.44	9.73	8.19	7.18
Value of Investments made	2.28	2.90	0.76	0.47

Above table shows consistent financial growth and focus on continued upgradation of the facility. Investments planned for 2023-24 is to the tune of 2.50 million US\$

Financial Indices

Solvency ratios	Industry Standard	Ratio as Feb 2023
Debt to equity:	<1	0.28
Debt service coverage ratio:	>1	3.87
Interest coverage ratio:	>3	7.76
Liquidity ratios	Industry Standard	Ratio as Feb 2023
Current ratio:	>1.33	5.93
Quick ratio:	>1	3.01

Above ratios indicate strong cash flow to meet long term liabilities

Defence

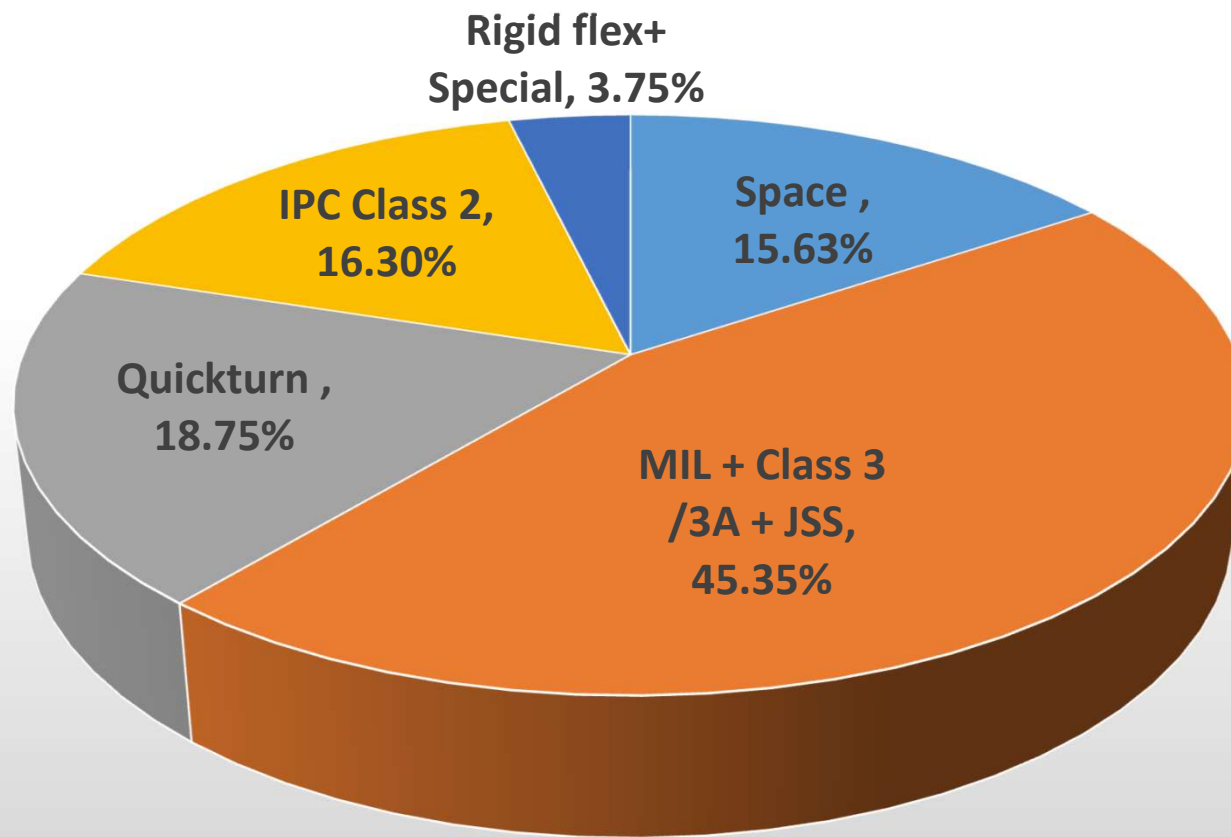
Aerospace

Telecom & Industrial Controls

Technology oriented projects with new materials /Processes / New technologies

Prototype – Quick turns

Segment wise breakup





NADCAP certification – Merit listing in QML. First and only PCB manufacturing facility in India to be approved to NADCAP (National Aerospace and Defense Contractors Accreditation Program). The certification scope cover all PCB technologies including Multilayer Rigid PCBs, Rigid Flex PCBs, HDI PCBS and Microwave / High Frequency PCBs.

Approvals



MIL 31032 Certification-Only manufacturing facility in Asia to be listed in US MIL QML / QPL. Certified to MIL 31032 /1, /2, /3, /4 and /5 covering multilayer Rigid PCBs with GF and GI materials, Rigid flex PCBs and Hybrid PCBs with Hydrocarbon Ceramic CCL+ FR4. Technologies include Blind and Buried via PCBs, Metal core PCBs, HDI PCBs and Nonconductive via filled PCBs.



- **AS9100D 2015** Certification. First PCB manufacturing facility in India to be approved to AS Quality management system.
- Quality management system approval – Certified for **ISO9001-2015** standards.
- **ISO 14001-2015** Certification for environmental management system.



Approvals

- UL-USA and Canadian safety approvals as per 94-V0 and 786 standards : File # E95743 (for Rigid PCBs)
- Quality management system approval – Certified for ISO9001-2015 standards
- LCSO /JSS – India Defence approval
(Electronic components standardisation organisation -LCSO)
for multilayer PCBs as per joint service specifications

Customer Approvals :

ISRO / CERN / Thales / Collins Aerospace / Honeywell Aerospace / Bharat Electronics / Hindustan Aeronautics Limited



Product Range

mp

- Rigid Multi Layer PCBs up to **38** layers
- Special Conduction cooled PCBs for heat sinking - Metal Core PCBs (Al, Cu) / Thermal clad PCBs (Al, Cu)
- Blind and Buried via PCBs
- HDI PCBs with Sequential lamination cycles
- Control Impedance PCBs
- Non- Conductive Via filled PCBs
- Cap plated PCBs
- Multilevel Flexible PCBs in Polyimide / Polyester
- Rigid Flex PCBs
- RT Duroid / Teflon PCBs for high frequency applications
- High Copper Rigid PCBs (up to 5 Oz copper)
- Hybrid PCBs (FR4 + Hydrocarbon ceramic / FR4 + Teflon)
- Buried resistance panels

Manufacturing Specifications

- MIL 31032/1, /2, /3, /4 & /5
- MIL PRF 55110J
- MIL PRF 50884G
- IPC 6012ES / E Class 3 / Class 2- For Rigid
- IPC 6013E Class 3 / Class 2 - For Flex / Rigid Flex
- Indian Space specification – ISAC / VSSC / SAC
- LCSO /JSS –Indian Defence Specifications
- DM 4020- BEL Specifications
- IPC- A-600 Class 3 / Class 2



mp

Manufacturing Capabilities

The logo consists of the lowercase letters 'mp' in a white, bold, sans-serif font, positioned on a blue rectangular background. To the left of this background, there is a stylized graphic of a circuit board with various traces and circular components in a light gray color.

Rigid	38 Layers (max layer count fabricated)
Rigid Flex	26 layers (max layer count fabricated)
Min. trace width /spacing	0.089mm (3.5mil) / 0.1mm (4 mil)
Min. finished diameter	0.15mm (6 mil) with mechanical drilling / 0.10 mm (4 mil with laser drilling for blind vias)
Max. thickness	5.5mm +/- 10%
Aspect Ratio	10:1
Impedance tolerance	+/- 10%
Max. production panel size	450mm x 700mm (MLB) / 1200mm x 610mm (D/S)
Final Inspection	100% Electrical tested; COC ; Cross-section analysis; Impedance measurements; Reliability tests as per MIL specs; FAI reports as per AS9100 requirements

Facility Upgrade

Focus on high reliability / Segment



CAM – Upgraded to **InCAM** from Genesis 2000

Press capacity enhanced - Burkle

Plasma capability enhanced. March plasma added

LDI upgraded to 28W laser – Soldermask exposing also with LDI

6 Spindle 200K RPM Posalux CNC drilling – Total 16 drilling spindles now

Plasma capability enhanced. March plasma

BBT- FPT capacity enhanced- Microcraft

CNC Jump scoring

Orbotech Ultra dimension AOI

Wet Processing machines – DES line with auto controls / 4- brush Deburring machine with ultrasonic cleaning / soldermask developer

Xact PCB software for registration

Filled Via copper plating for microvias

Hole checker

Reverse pulse plating

To be installed by Dec 2022

mp

- 2 Schmoll CNC drilling m/cs – 8 spindles
- 6 electroplating baths with RPP
- 6 opening Vacuum press Burkle
- Direct Imaging for SM – Schmoll
- Cutsheet laminator – Hakuto
- Addnl Polar Speedstack licence
- Screen Printer – ATMA
- Enhancement of approved electrical power incl UPS
- Schmoll Hybrid (CO2 + UV Laser) by Mar2023

Inkjet printer – Orbotech Sprint 10022000DPI – Laser plotter - EIE

Auto alignment UV exposure – Alitix

UV Spectrophotometer – Perkin Elmer

XRF – Fischer

Gerber analysis – Barco

Integr8tor

10000Sqft Shopfloor area added

Impedance software & measurement hardware - Polar

LDI – Orbotech Nuvogo

Dual wavelength 14W laser source

Via filling capability- ITC via filling + Wise Planariser

Sodermask – Spray coater– All4PCB

BBT – Large frame FPT – Microcraft

Pinless Registration – DIS

X Ray Drilling - Muraki

CO2 Laser drilling - Hitachi.

Plating capacity enhanced with new auto PAL electroplating line

15000Sqft- Shop floor space added

Upgradation of CAM software to Incam Pro

Video Inspection systems - Tagarno.

Antistatic cleaners

Installed / completed :

2MW Wind power source

2X Orbotech AOI _ 1 Verification station

BBT Grid tester

Upgradation of electroless / ENIG lines doubling the capacity

5000 Sqft Shopfloor area



Integr8or : Pre Engineering – Input analysis with Ucamco integr8tor Software



PCB stackup, signal integrity and controlled impedance



Engineering CAM – DRC & DFM with Frontline InCAM Pro software



Software to achieve the best registration control

Imaging – Laser Direct Imaging with Orbotech Nuvogo & Schmoll MDI TT



DES – Wise Italy with automatic controls

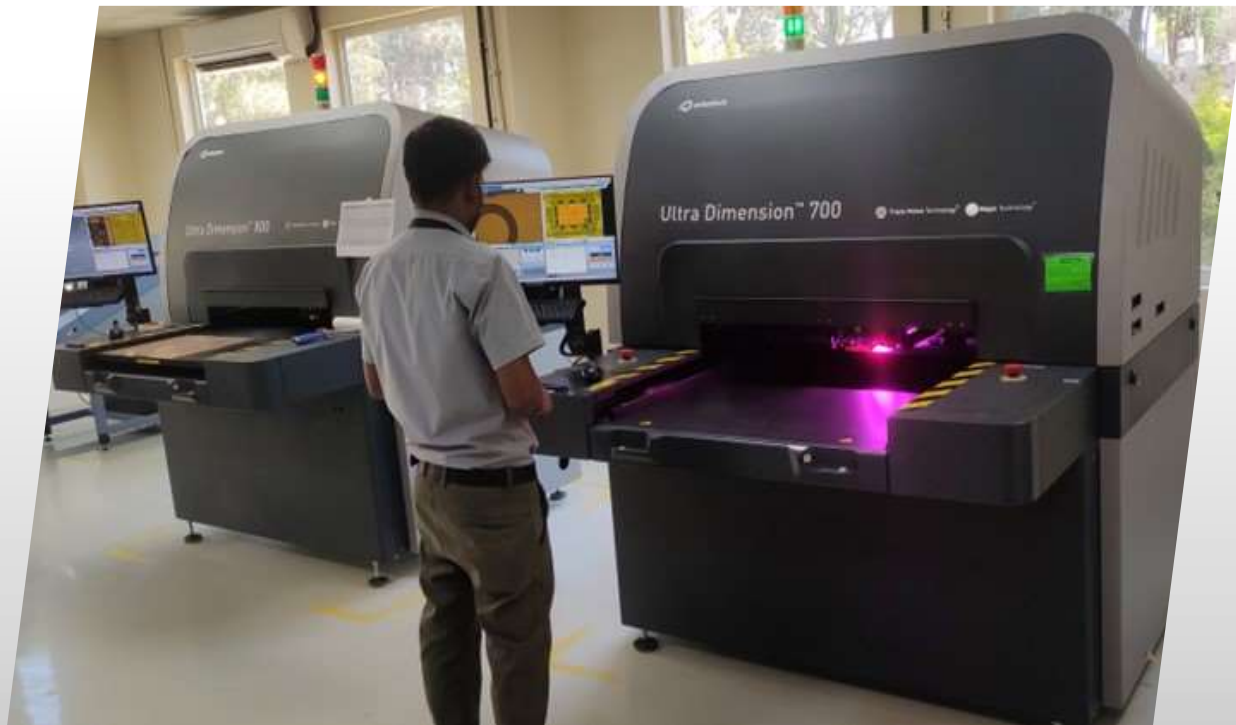


Process Brief

mp

Automatic Optical Inspection

Orbotech's Ultra Dimension™ is a 4-in-1 AOI solution / Discovery



Process Brief

mp



Registration – Camera assisted pinless registration system - DIS

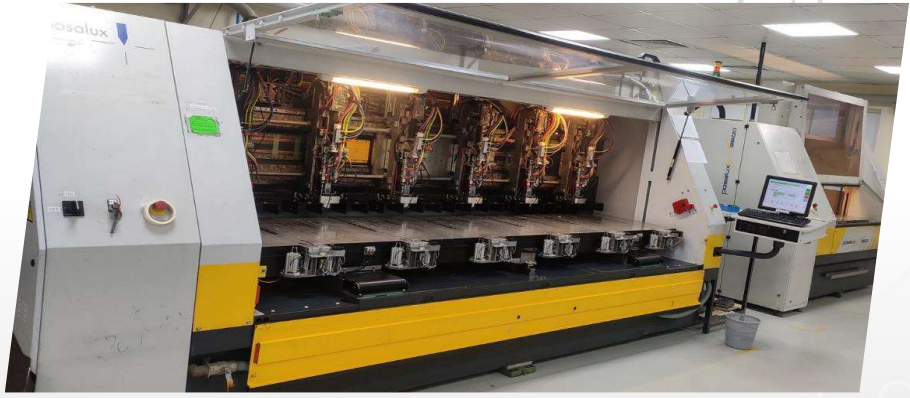
BURKLE
PROCESS TECHNOLOGIES

Multilayer Press- Hot oil press – 1x 6 opening+ 1 x 2 opening





CNC Drilling – 24 spindles - 200K RPM spindles for small hole drilling – Posalux / Schmoll maschinen



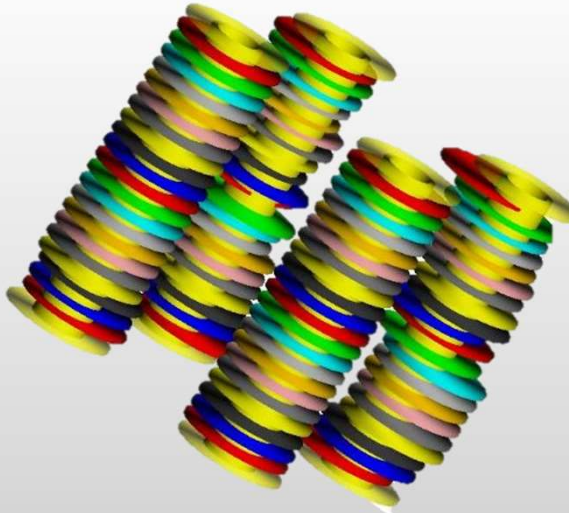
Process Brief

mp



PCB registration control and prediction

Scale Errors Range (ppm)		
	Short	Long
Range	762	778
Scale Errors (ppm)		
All	Short	Long
Common	-35	294
L01	-140	-24
L02	-88	286
L03	-138	279
L04	43	456
L05	59	468
L06	18	448
L07	43	453
L08	-351	594
L09	-344	587
L10	-359	110
L11	373	441
L12	-379	116
L13	-293	580
L14	-282	596
L15	-55	428
L16	-32	441
L17	5	474
L18	-10	489
L19	-184	247
L20	-173	289
L21	-298	-182



MURAKI LTD.

Multi-Point Compensating X-Ray 2-Spindle Drilling Machine

Process Brief

Hole treatment – Plasma treatment / Wet desmear
Full fledged Chemical lab including UV
Spectrophotometer / CVS (Cyclic Voltammetric Stripping)
analysis and titration



mp

Nordson
MARCH

Process Brief

mp

Plated through Hole – Electroless plating followed by Electrolytic plating
PLC controlled PAL Automatic plating lines





Non-conductive Via Filling – with Taiyo THP 100 paste

ITC Via filling machine with vacuum. Can do blind via hole filling also



Wise Cleverstar Planariser



Process Brief

mp

Etching – Fine line etching with IS etching machine. 100% verification with AOI
Solder masking – All4PCB Spray coating machine with inline IR + hot air convection oven.

Soldermask exposure using LDI.

Silkscreen – Inkjet printing using
Orbotech Sprint 100



Process Brief

100% BBT by Flying Probe testers / grid tester – Max panel size upto 810x510mm
Pre-despatch Inspection – Full fledged microsection / Visual inspection facility
Impedance measurement – Using Polar 800 Si

mp



Laser drilling facility :

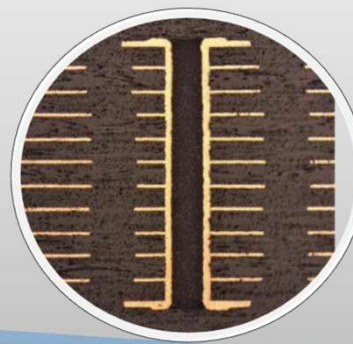
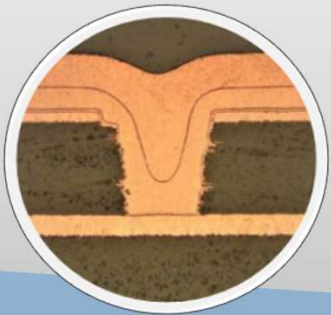
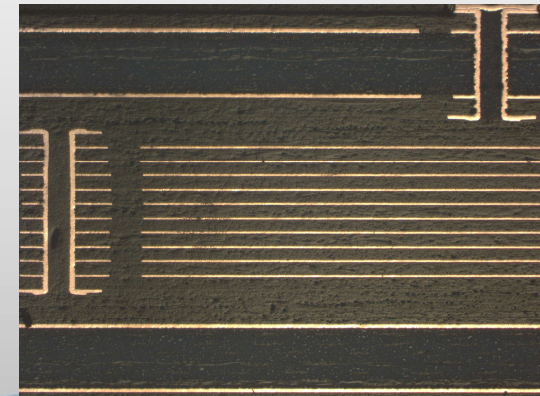
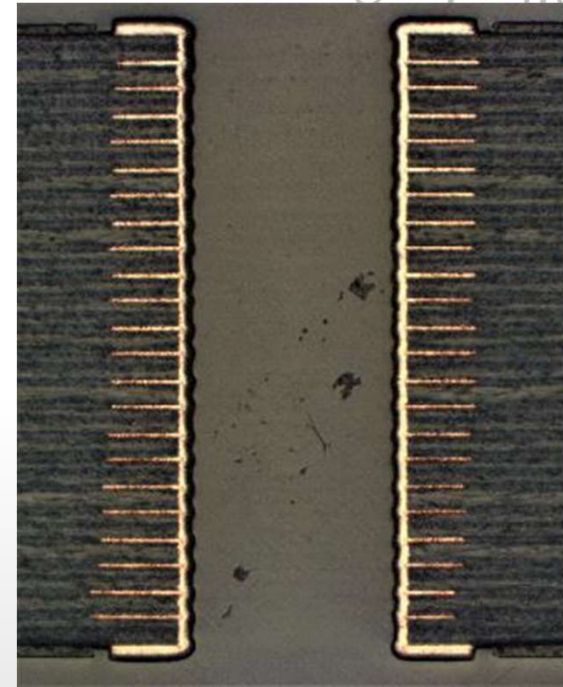
Drilling of 0.10mm holes for HDI PCBs

Also being used for profile cutting of RF PCBs with Teflon based materials

Being enhanced with Hybrid laser by April 2023



Full fledged Microsection lab



- FR4 (Tg 170 / Tg 210) : **Isola** - 370HR / 185HR / I-Tera MT40 / 408HR / I-Speed | Iteq – IT180A
Nelco- 4000-13EP | **TUC** - TU768 / 862HF / TU 933 | **Ventec** – VT47 | **Panasonic** – Megtron6
- Rigid Polyimide (Tg 250) : **Nelco** – 7000 / **Ventec** – VT 901 / **Arlon** 35N
- Integrated Metal Substrates (IMS) – **Aismalibar** / **Laird T Lam** / **Berquist** / **Polytherm** / **Ventec**
- Flexible materials – Polyimide (adhesiveless FCCL) : **Dupont** Pyralux / **Thinflex** A&W Series / **Panasonic** Felios
- PTFE : **Rogers** RT Duroid 3000 , 5000 &6000 series / **Taconic** / **Arlon**
- Hydrocarbon ceramic laminates : **Rogers** 4000 series
- No flow Prepreg – **Arlon** 49N / 37N | **TUC** TU84P | **Ventec** 47PP NF
- **Arlon** 85NT Polyimide Aramid substrate
- Embedded Resistor foils – Ohmegaply / Ticer

- Desmear Chemistry – Dow Chemicals (Formerly Rohm & Haas / Shipley)
- Electroless Copper Chemistry – Dow Chemicals (Formerly Rohm & Haas / Shipley)
- Electroplating Copper Chemistry – Dow Chemicals (Formerly Rohm & Haas / Shipley)
- Tin Plating Chemistry - Dow Chemicals (Formerly Rohm & Haas / Shipley)
- Etchant – MacDermid
- Oxide Treatment –Atotech, Germany
- Electroless Nickel Immersion Gold – Atotech, Germany
- Gold Tab Plating – Dow Chemicals (Formerly Rohm & Haas / Shipley)
- Surface Treatment / Resist stripper – RBP, USA

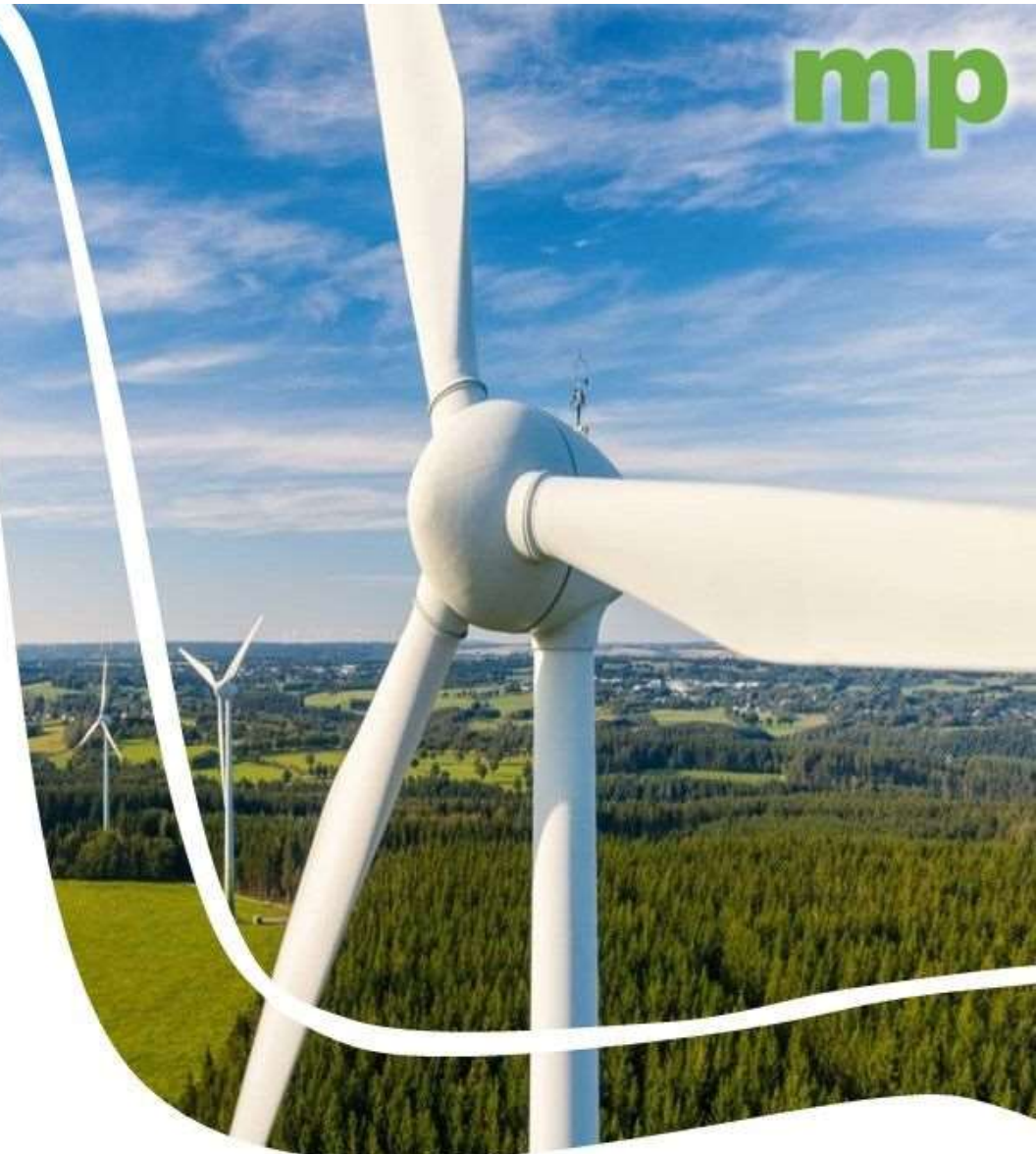
- Electroless Nickel Immersion Gold
(ENIG :0.05-0.1microns of Gold over 4-6 microns of Nickel)
- HASL - Hot Air Solder Levelling
- Electrolytic Gold – 0.5 - 3 microns gold over 4-6 microns of Nickel
- Electrolytic Gold – 0.5 – 3.0 microns gold directly on copper
- Soft Electrolytic Gold - (Upto 3 microns Gold directly over copper)

Micropack goes green

- **2.0MW** captive wind power plant commissioned at Ujjini, Bellary and connected to the grid in June 2022
- Entire power requirement of Micropack to be met with this clean energy

Committed to a clean Green World

mp



www.micropack.in

Power Backup



Entire plant under UPS of capacity of 1250 KVA and synchronized with 6 x Diesel generators of 2000 KVA





Fully automated Effluent treatment plant of 100 KLD. Moving to Zero Liquid Discharge system by June 2023

Investments made in 2022

mp

- CNC drilling machines – 8 Spindles including capability for vision drilling, especially for back drilling
- 6 Opening multilayer press – Enhancing capacity
- 2 AOI machines from Orbotech – Additional capacity
- Additional capacity for plating with Reverse pulse plating – 6 additional plating baths
- Additional Direct Imaging machine from Schmoll – Multiwave length. Additional capacity for solder mask exposure. Can do big size panels upto 48”
- Enhancement of Bare board testing – Fixture tester for medium volume
- Additional 2nd transporter for automatic ENIG line – enhanced capacity
- Cut sheet laminator / antistatic cleaners for inner layers

Planned Investments in 2023

mp

- Additional seats of CAM and Polar impedance software – By Apr 2023
- Hybrid laser – UV + CO2 for enhanced capability including Flex cutting / 2 level microvia drilling. To be installed by May 2023
- Upgradation of ETP plant to Zero Liquid Discharge facility – By June 2023
- Facility upgradation – Outer layer developer / Post cleaner after HASL
- HATS tester – By June 2023
- Video Measurement system – By June 2023
- Pin Registration System – By Oct 2023

Contact

Plant Head

Mr. Pradeep. M

Mobile: +91 7760976708

mp3@micropack.in

Operations Head

Mr. Sharath Reddy

Mobile : +91 7760976700

sharath@micropack.in

Technical / Engineering

Mr. Nagaraj.U

Mobile : +91 7760976718

process@micropack.in

Sales

krupavarma@micropack.in

customersupport@micropack.in

3/28/2023

Micropack Pvt Ltd



mp



Thank you

